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No. 19

\$2000-\$3000 Car Production Probably Less in 1922

3.6 per cent of car production since 1912 has consisted of cars in this price class. 2.5 per cent of 1922 sales will probably be in this group. Price cuts last year caused drop. Good business for remaining makers.

By Norman G. Shidle

Charts and Statistics by Raymond B. Prescott

IN 1922 there are 17 members of the N. A. C. C. producing cars in the \$2,000-\$3,000 class. These 17 makers constitute 20 per cent of the total N. A. C. C. membership. Calculations made on the basis described in previous articles in AUTOMOTIVE INDUSTRIES show that about 2.5 per cent of the total production in 1922 will consist of cars in this price class. In other words, there is 21 per cent of the manufacturers competing for 2.5 per cent of the total business—total business, in this case, being considered on a production basis.

The production capacity of the firms now making cars of this class is something like 70,000. The calculated production of the group for 1922 is 42,500. This indicates an excess production capacity for the group as a whole of something like 40 per cent.

Viewing the figures over a period of years, it appears that of 11,162,000 cars made and sold since 1912 about 403,000 have sold for prices between \$2,000 and \$3,000. That is, 3.6 per cent of the total car production since 1912 has consisted of cars in this group.

Based on past records there is every indication that the number of cars produced and sold in this price class will diminish during 1922. The percentage of cars in this group as related to total car production

will also diminish. These are the chief facts concerning the present status of the \$2,000-\$3,000 group.

Fig. 1 shows the production of cars in this price class as compared with the actual and normal total car production since 1912. The group as a whole has not followed very closely the general trend of the industry. The growth of production in this \$2,000-\$3,000 group, for example, failed to keep pace with that of the whole industry during period of 1915 to 1917, which may be considered, in a sense, as the normal years in which the industry was growing into its period of stability.

When normal growth was interrupted by the war, however, this group grew more rapidly during the boom years than did the entire industry. The fact that this accelerated growth was due largely to the war boom, however, is indicated by the fact that the deflation of this group has been more pronounced than that of the whole industry.

Analysis of the curves shown in Fig. 1 indicates that the \$2,000-\$3,000 group is rapidly returning to a period in which its progress will be normal in relation to the trend indicated for it during the pre-war normal period. In other words, the ratio of cars in this price class to total cars produced will probably tend to remain stationary and is very likely to decrease.

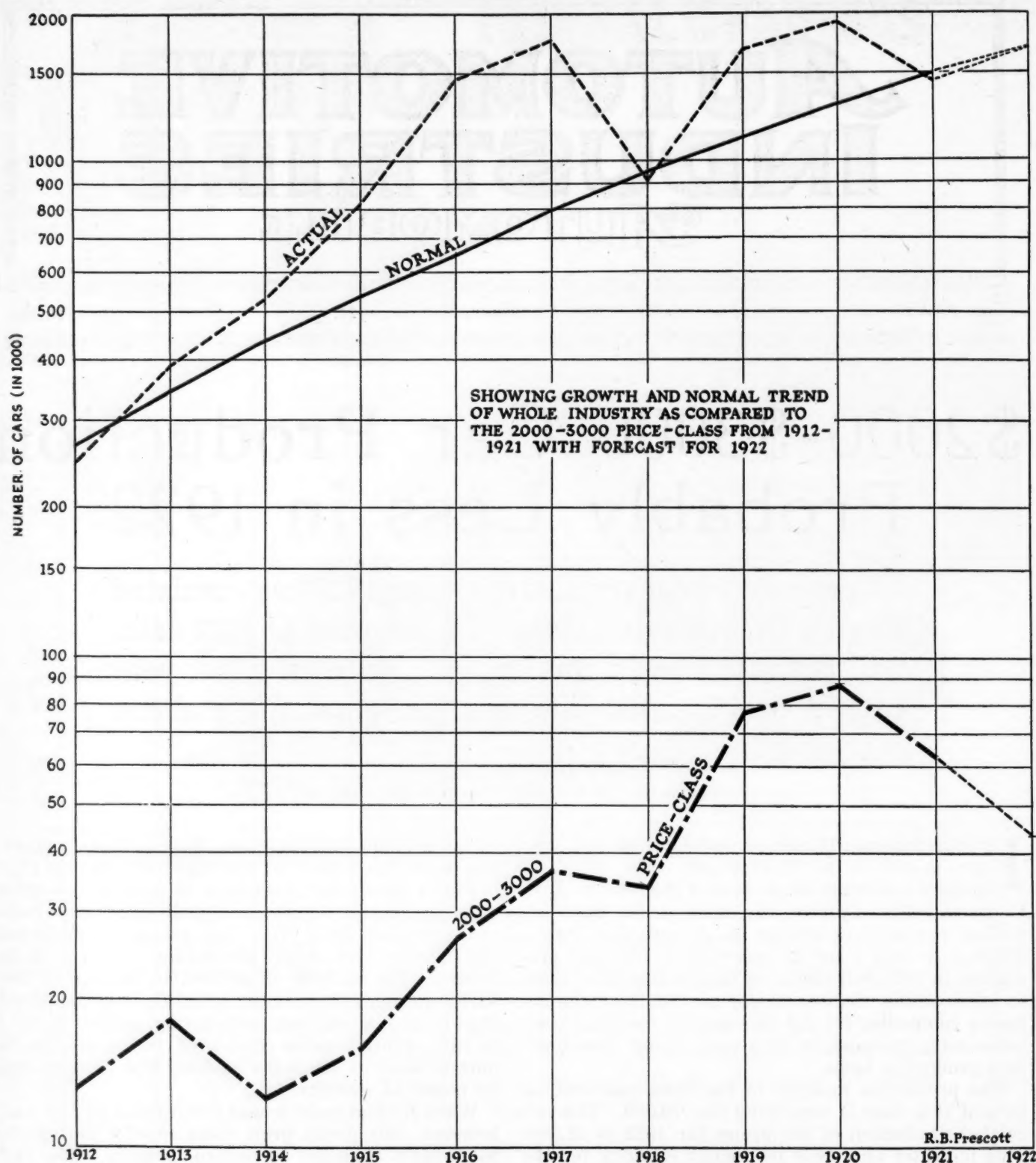


Fig. 1

As in the \$1,000-\$2,000 class discussed in a previous article, there is no apparent connection between the number of manufacturers entering this \$2,000-\$3,000 group and the proportion of total production that could reasonably be expected by the group for a given year.

Fig. 2 brings out this point clearly. The only significant feature that appears is the definite increase in the number of manufacturers entering this group in 1922 and the definite decrease in percentage of total production that the group may expect to sell.

Production is not the only basis of gaging success, of

course, since a company or a price group may be sound and stable without having kept pace with the actual production of its competitors. Consequently, too much emphasis should not be laid solely upon production trends. The gross business available in a given price group, for example, is equally as important as the production possibilities.

The following table gives in a general way the gross sales value of the number of cars which it is calculated will be produced in the various price classes during 1922, together with the percentage of the total gross

business. In arriving at these figures for gross business, the number of cars calculated to be produced in the given price class have been multiplied by the average selling price of a car in that price class. Obviously, the results will not be exact, but they are close enough for purposes of comparison and discussion.

Price Class	Gross Business	Per Cent of Total
Under \$1,000	\$633,000,000	49
\$1,000- 2,000	459,000,000	34
\$2,000- 3,000	106,250,000	7
\$3,000- 4,000	59,500,000	4
Over 4,000	42,500,000	3

This shows that the manufacturers in the \$2,000-\$3,000 class, comprising 20 per cent of the total number of car makers, are competing for 7 per cent of the total gross business, viewed from a financial standpoint, and, as noted previously, this 20 per cent of makers are competing for 2.5 per cent of the total sales, viewed from a production standpoint.

Considering sales competition in the light of the probable gross sales figures for 1922, it would appear that competition in this \$2,000-\$3,000 group is even keener than in the \$1,000-\$2,000 group discussed in our article of March 23. That article showed that 46 per cent of the manufacturers comprise the \$1,000-\$2,000 group and that they are competing for 18 per cent of the total business, viewed from a production standpoint; and for 34 per cent of the business, viewed from the financial standpoint.

Few cars have remained in this \$2,000-\$3,000 price group over a period of years. Only one car has remained within this price class from 1912 to 1922. New cars put on the market have frequently started in this price class, although no new cars entered it during 1921. Of the 19 cars entering this price group since 1912, 11 are still in existence. Four firms went out of business while members of this price group. The following table shows the movement of companies in and out of this price group since 1912.

The individual manufacturer can make use of these data for aiding in the solution of his special marketing

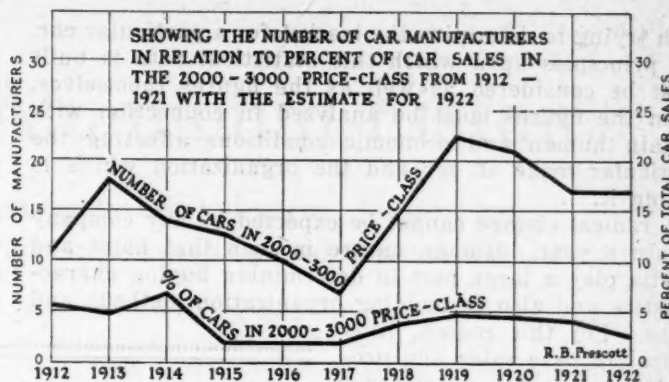


Fig. 2

	1912	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922
Total in group...	11	18	14	13	10	7	15	22	21	17	17
New cars		6	2	0	0	3	1	3	2	0	2
From lower price group		0	0	1	2	0	8	7	2	2	0
From higher price group		4	2	2	3	0	0	0	1	2	7
Out of business..		1	1	1	3	0	0	0	0	2	0
To lower price group		0	5	3	5	1	0	0	0	3	9
To higher price group		2	2	0	0	5	1	3	6	3	0

problems in the same way as was outlined in the discussion of the \$1,000-\$2,000 group. A particular company is concerned with determining as nearly as possible the number of cars which it may reasonably expect to sell throughout the year. A very close approximation of this number can be obtained by a proper correlation and analysis of this statistical data. First, it is necessary to consider the limitations and probabilities of the price group in which the particular car sells. Then, the relation of the past progress of the individual car in relation to the progress of the price group must be analyzed.

Increased business for any given car maker can come only by taking away some of the business previously held by others or by the retirement from business of some companies, thus leaving more business for the remaining firms.

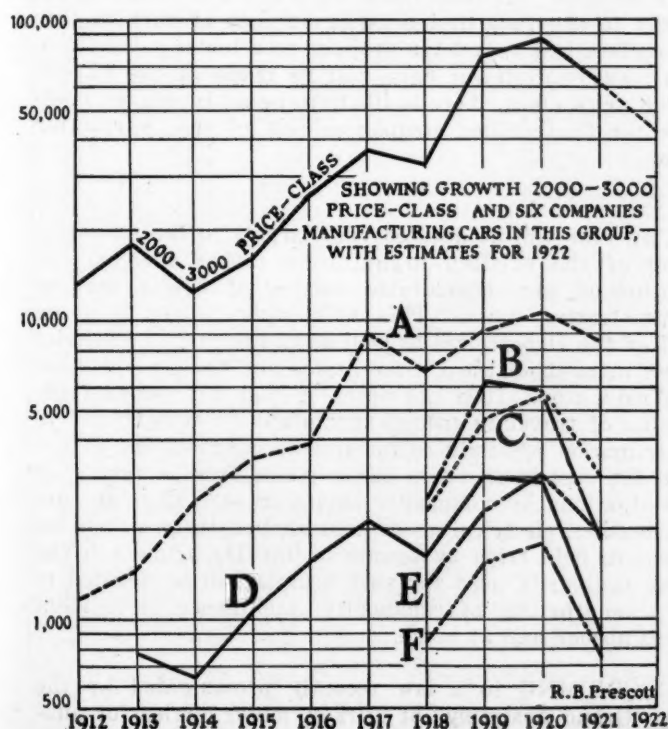


Fig. 3

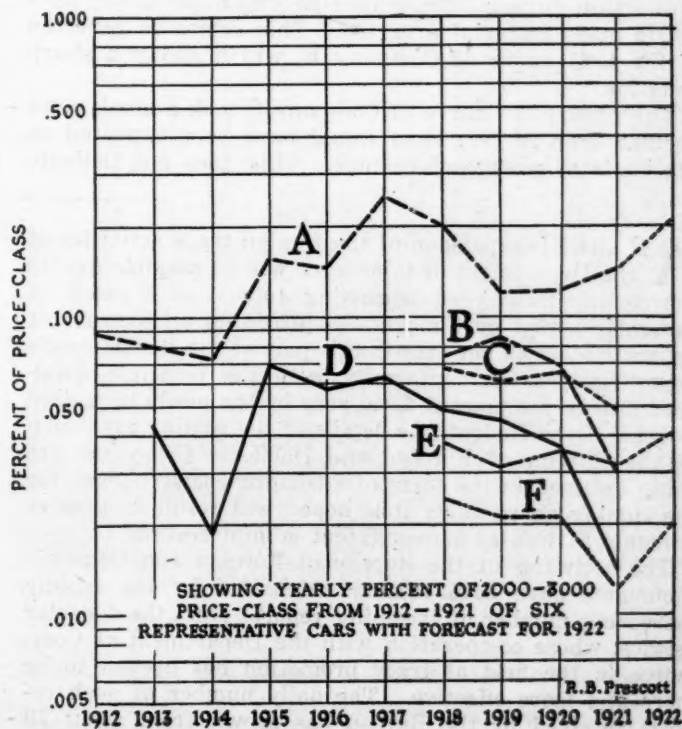


Fig. 3a

In trying to determine the market for a particular car, the principles upon which this statistical data is built must be considered as well as the figures themselves. Then the figures must be analyzed in connection with certain human and economic conditions affecting the particular make of car and the organization which is selling it.

A radical change cannot be expected by any company within a year. Human nature is such that habit and inertia play a large part in determining buying characteristics and also in molding organization methods and ideas. For this reason, it is logical to base sales and production plans for a brief period in advance upon a study of past trends.

Fig. 3 shows the production progress of six typical cars in the \$2,000-\$3,000 price group. All of these cars have followed rather closely the ups and downs of the price group.

Company A, which stayed in this same price group throughout the period under discussion, shows a steady progress, somewhat more rapid than the group as a whole in the early part of the period. It suffered less decline in the depression period of 1921. On the basis of past performance it is reasonable to suppose that this company will continue to produce about the same percentage of the total price class production as in recent years. Its curve indicates, moreover, that its production capacity is not much in excess of the number of cars which it may reasonably expect to produce during 1922.

Company B, on the other hand, showed a decline in production during 1920, a year in which the group as a whole made material progress. This action is reflected in the 1921 curve of Company B, which shows a sharp deflation.

The production curve of Company C took a much more decided drop in 1921 than would have been expected on the basis of past performance. This does not indicate

that the past figures are not a good basis for prediction, but simply illustrates the necessity for taking into consideration such factors of internal financial condition or changes, management readjustments, etc., which cannot, under any circumstances, be predicted on the basis of past statistical data.

The progress of Company D is very similar to that of Company A and to that of the price group as a whole. Companies E and F follow the total group trend very closely, except for 1921 when they took a more decided drop than the group as a whole.

Taken as a whole, there is comparatively little variation in the development trend of the various companies represented on this chart. The differences are nothing like so marked as were those of the companies in the \$1,000-\$2,000 price class discussed in the March 23 article. The present curves may be interpreted as indicating that companies in the \$2,000-\$3,000 price class are more closely dependent upon economic factors affecting the group as a whole than upon the individual characteristics and possibilities of the various firms. The individual companies seem to be more closely dependent upon the progress of the entire group than is the case in the next lower price class. Consequently, manufacturers in this group can probably estimate

their production possibilities rather accurately by studying carefully the limitations and trends of their price group as a whole.

There will be less cars produced in the \$2,000-\$3,000 price class in 1922 than there were in 1921. This is due chiefly to the fact that a large number of cars in this price class last year have dropped to a lower price class. Thus, although fewer cars will be made in the \$2,000-\$3,000 price class, there is likely to be an increased business for those older companies left in this particular group.

THIS is the third of a series of articles dealing with the production possibilities of the price class groups in the passenger car field.

The previous articles dealt with the:

Industry as a whole—November 17, 1921.
\$1,000-\$2,000 price group—March 23, 1922.

The articles to appear in the near future are: the price groups:

Under \$1,000
\$3,000-\$4,000
Over \$4,000

To executives and those who have the responsibility of setting production schedules and making business plans this series of articles is of vital interest. The material has been secured from original, accurate research and presents data from a hitherto unexplored angle.

A MARKED expansion of the foreign trade activities of the Department of Commerce will be possible during the coming fiscal year, beginning July 1, as a result of favorable action by Congress in providing an increase of approximately 30 per cent in this part of the Department's appropriation. In conformity with the principle developed during the present fiscal year by the newly organized Bureau of the Budget, the details of the coming expansion of the Bureau of Foreign and Domestic Commerce are being outlined in the form of a comprehensive budget for the coming year, which it is hoped will result in greater economy as well as more efficient administration.

The activities of the Bureau of Foreign and Domestic Commerce have been further intensified by the rapidly increasing number of incoming reports from the consular service, whose co-operation with the Department of Commerce in the field of trade promotion has proven to be more and more effective. The daily number of such reports received by the Bureau has grown from about 70 to 120 in the course of the past ten months.

In general it may be said that the program for the

coming year will be devoted very largely to the strengthening of the existing organization rather than to the addition of any considerable number of new phases or administrative units. This will apply to the over-sea staff of the Department as well as to the chain of district offices throughout the United States and the headquarters in Washington. It is not probable that any considerable number of traveling special agents will be sent abroad to study market possibilities for specific commodities, as has been the custom in years past. Aside from a few brief investigations by commodity chiefs in such lines as rubber, textiles, electrical goods, and lumber, there will be no extensive field trips by agents of the Department. The funds ordinarily used for such travels will be devoted to the strengthening of commodity intelligence in resident offices abroad and at home.

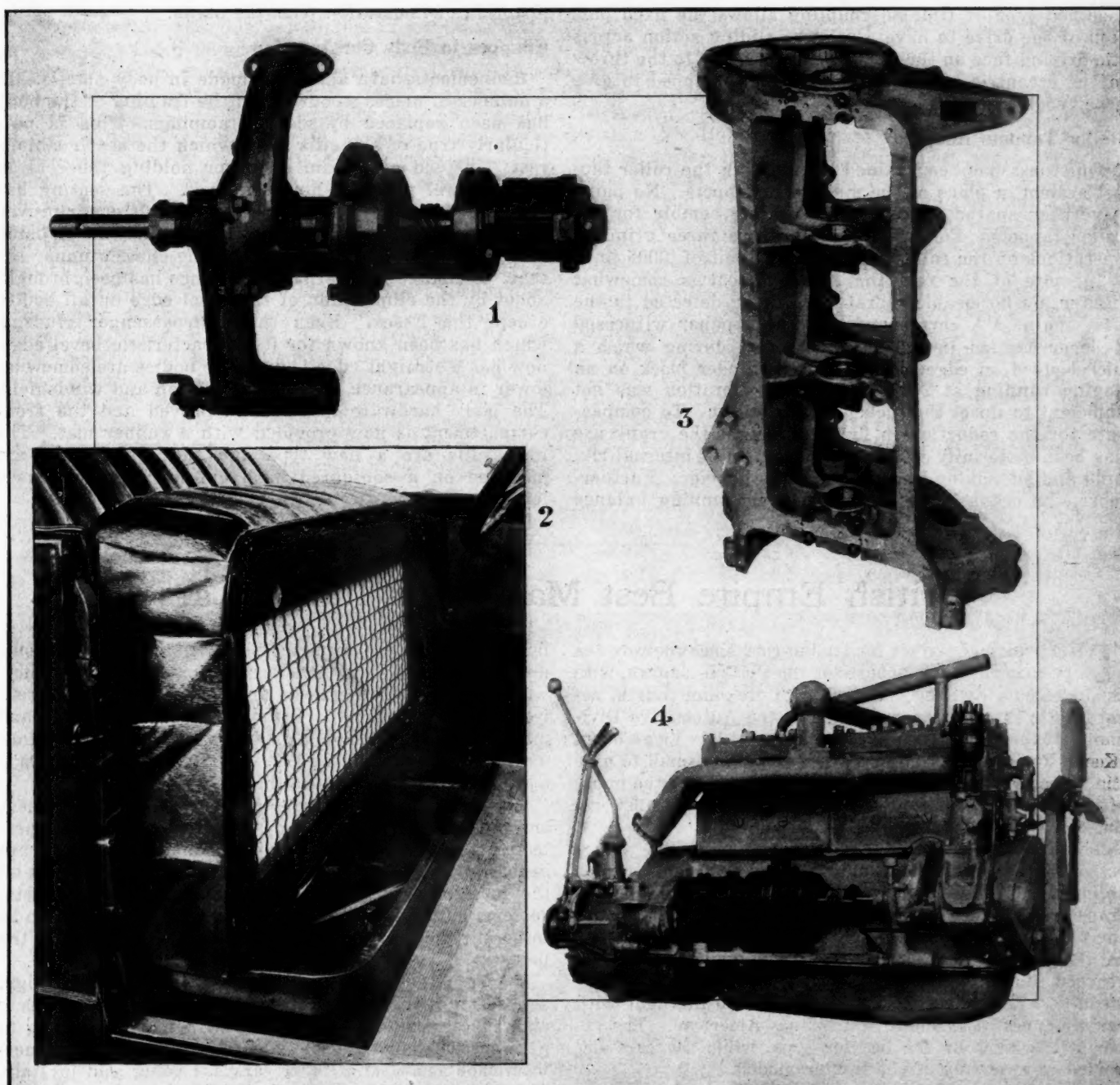
A CCORDING to a law recently promulgated by the "Grand Assembly" of Turkey, motor lorries for public purposes will be admitted into Turkey free of Customs duty. Oil and petrol will also be admitted duty free.

Hudson Adopts Aluminum Piston

New Hudson model carries piston similar to Essex design. Morse chain replaces gears in front end drive. Roller tappets used instead of mushroom.

REFINEMENTS and changes in the motor of the Hudson super-six have resulted in considerably improved performance and quietness. Probably the most significant change made is the adoption of aluminum pistons similar to those successfully used in the Essex engine. The manufacturers feel that in this

type of constant clearance piston, previous objections to aluminum pistons have been overcome. A change has been made from the Essex piston design in respect to guiding the oil to the piston pin. The pin is now a full floating type. The iron piston weighed from 32 to 40 oz., the latter being the weight of the heaviest oversize,



1—Water pump driveshaft assembly. 2—On the new Hudson bodies, the seats are doweled into place. 3—Crankcase more heavily ribbed. 4—Hudson super-six engine which has been revised in detail.

but the aluminum piston weighs only 16 to 16 $\frac{3}{4}$ oz. The weights of the piston are held within limits of $\frac{1}{4}$ oz. and the weights of the rods within the same limits. The piston pin is locked against end travel by means of rings in the piston boss, and is made $\frac{3}{8}$ of an inch shorter, so as to make room for these rings.

The front end drive has been changed from a gear drive to one by Morse chain. In this installation the water pump sprocket rotates as an idler on a bronze adjusting eccentric which is drilled off center. The drilled opening takes the water pump driveshaft. The floating bronze member is driven off a driving flange on the sprocket and there is a floating member flanged to take the fixed portion of the coupling. This is drilled and keyed to connect with the water pump shaft, which is also pinned to the fixed coupling member. To adjust the center distance between the sprocket centers on the chain, the adjusting flange is rotated. The use of this modified type of Oldham coupling allows the fixed portion of the drive to have a relative sliding action across the driving face on the floating member, due to the throw of the eccentric. This sliding portion is lapped to give a perfect sliding fit.

Roller Tappets Adopted

Quietness has been gained by adopting the roller tappet system in place of the mushroom tappets. No pains have been spared to give an accurate assembly for the roller tappets. For instance, there are three grinding operations on the roller pin held to a limit of .0005 in.

In spite of the fact that the flywheel is somewhat lighter, no noticeable vibrations can be detected in the new engine. A correspondent of this paper witnessed a demonstration in the final block test during which a nickel stood on edge on top of the cylinder block on an engine running at 2000 r.p.m. The vibration was not sufficient to upset the nickel at this speed. To compensate for the reduction in flywheel weight the crankcase has been materially stiffened by a system of internal ribbing and by making some of the walls heavier. Furthermore, the crankshafts are now put in running balance

on an Olsen type of machine which accurately measures the unbalanced moment, indicates the point from which metal must be removed and gives the weight of the material that must be removed to put the shaft in both static and dynamic balance.

Camshafts are now machined on the Melling automatic cam lathe made by the Walcott Lathe Co., which turns 25 camshafts per hour. This has taken the place of three other machines with a capacity of only 9 per hour. The new lathe turns all cams at once, whereas the former machine only turned six, after which the camshaft had to be shifted for the turning of the other six cams.

Another interesting manufacturing operation in connection with the engine is the turning of the pistons. With this new machine, one of the aluminum pistons is rough turned in 14 sec., which is believed to be a record for this type of piston. This operation is performed on an automatic machine, which practically finish-forms the piston in one operation from the blank.

Changes in Body Construction

Refinements have also been made in body details. In a number of places woodwork in the framing of the body has been replaced by metal stampings. This is particularly true of the sills upon which the seat cushions rest. Instead of a trim strip for holding the seat in place, dowel pins are now employed. The seating has been rearranged, the contour of the upholstery improved to give more comfort, and the battery, instead of being hung in the body, is now hung in the chassis under the seat. A change in external appearance has been brought about by the elimination of the bevel edge on all bodies except the Essex. Even the four-passenger Hudson, which has been known for its characteristic bevel edge, now has a straight edge body. The bodies are somewhat lower in appearance, due to a lower top and windshield. The body hardware has been improved and the front compartment is now provided with a rubber mat. The robe rails are a new type and the instruments are mounted on a contoured dash cut-away for increased leg room.

British Empire Best Market for Italian Cars

THE principal market for Italian cars since the war has been in the various parts of the British Empire, with Spain second, Switzerland third, and Belgium fourth, according to information submitted to the Automotive Division of the Department of Commerce by Vice-Consul Keene, Rome. The Italian market is far too small to give the industry sufficient work in normal times, and the imposition of the circulation tax on automobiles in 1920 reduced the consumption of cars to a minimum.

The automobile industry of Italy, although the youngest of all the mechanical industries of that country, has reached the highest stage of development, and the export trade has attained high importance. Unfavorable symptoms began to be noted in this foreign trade, however, in the years preceding the war, and while exportation reached its maximum in 1921, importations increased steadily. The industry found itself in a losing fight with certain types of foreign cars, mainly American. The exportations were of the heavier type, while the cars imported were mainly of the lighter models.

During the war the industry found plenty of work executing Government war orders, and for some time after the war period manufacturers were busy supplying the demands of the large number of persons made wealthy

by the war. In the foreign fields, Italian trade was made almost prohibitive by the protectionists' tariff policy, which sought to preserve in time of peace the belligerent isolation of war times. In spite of these obstacles and difficulties, the automobile industry still found important markets abroad, until in 1919 and 1920 the export trade equalled and even surpassed that of pre-war years.

The situation for the industry is unfavorable at present on account of the lack of raw materials, due to the protective tariff in force in Italy. The manufacturers are generally of the opinion that the policy of shutting out all the foreign goods possible, by the imposition of drastic customs duties, must be modified by the Government so as to permit the entry of the raw materials necessary to the industry.

The cost of production of Italian motor cars is so high, as a result of the tariff barrier, that in certain instances it allows American cars to compete with them, according to a recent communication to the effect that certain American-made small six-cylinder cars are being sold in Italy. The representative of the American firm that sold the cars thinks that an active agent should be able to do a good business in spite of the adverse exchange and high tariff.

New Designs Added to Growing List of Special Bus Chassis

Garford and Fageol produce special chassis for bus and stage service. Underslung springs and worm permit use of lower body platforms, while kickup in frame gives necessary axle clearance. Wider tread gives more body space and greater stability. Unit powerplant used in Fageol stage.

AMONG the recent developments in passenger carrying vehicles is the production of a special bus chassis by the Garford Motor Truck Co. While this chassis, which is known as Model 51, naturally incorporates certain units which are identical with those used in truck chassis of the same make, it is designed especially for passenger carrying purposes. To facilitate ease of entrance and egress the frame has been so designed that it is only 25½ in. from the ground when loaded, and this, of course, helps to lower the center of gravity and decrease side sway. The frame is made to accommodate bodies with seats for 25 to 29 passengers, the length being varied accordingly. The body space measures 247 in. in length in the case of bodies accommodating 27 to 29 passengers and is 30 in. shorter when bodies with 23 to 25 seats are provided. The wheelbase in the two cases is 192 and 186 in. respectively. The frame width is 36 in. front and 52 in. rear. The frame is made from ¼-in. pressed steel having a channel section 6 in. deep with 4-in. flanges, and has seven cross members which are hot-riveted in place. The side members are given a kickup of about 7 in. over the rear axle in order to provide the requisite axle clearance, and the springs are underslung.

The chassis is powered with a four-cylinder 4¼ x 5½-in. Buda engine which is said to have been developed especially for bus applications. It is equipped with magneto ignition, and a six-volt electric starting and lighting

system, including a 100-amp. hour battery. The cooling system includes a centrifugal pump, four-blade fan driven by 2-in. flat belt and a radiator with cast aluminum upper and lower tanks and tubular core. The clutch is of the multiple dry disk type.

The four-speed gearset is mounted amidship in a three-point support between two cross members and is provided with a 4 x 10-in. foot operated brake.

The universal joints, of which there are four, are all of the metal-to-metal type. The rear axle is a Timken product and is fitted with an underslung worm and arranged for Hotchkiss drive. The road clearance is only 5½ in. when standard 36 x 8-in. solid tires are employed. Wheels are of center cushion type, with metal spokes, and are mounted on roller bearings.

The hand operated brakes act upon rear wheel drums, which measure 21 x 3¾ in.

The front axle is of the reverse Elliot type with 3 x 2½-in. drop forged center, arranged to accommodate the low hung frame. The screw and nut type of steering gear is fitted with a 20-in. wheel and is mounted outside the frame at the left side. This brings the operator well to the left and gives ample entrance room.

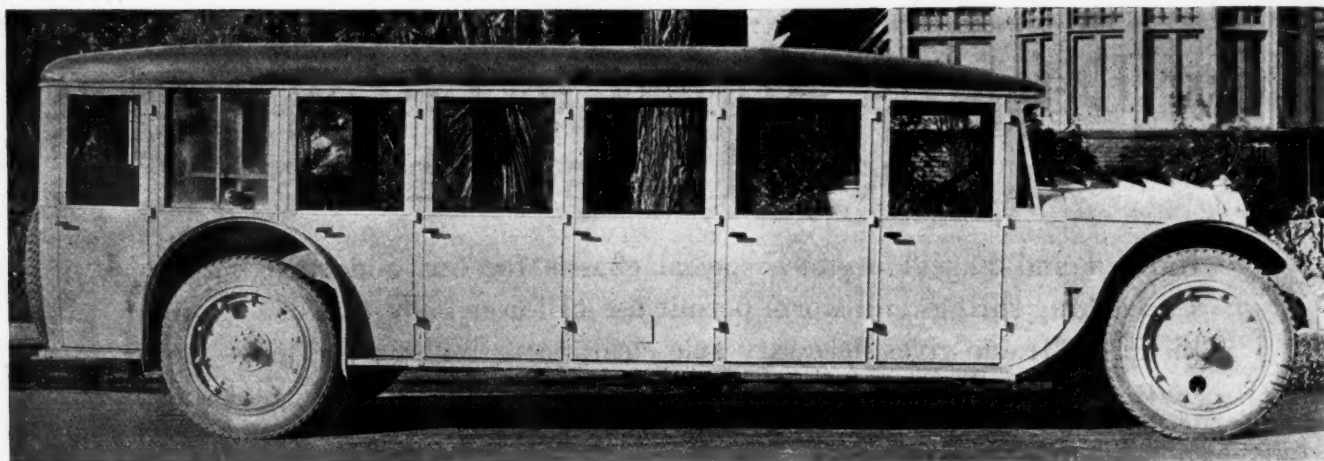
All springs are of the semi-elliptic type, their dimensions being as follows: Front, 42 x 3 in.; rear, 60 x 3½ in.

The tread or gage is 74 in. rear and 68 in. front.

Among the items of equipment not already mentioned are a 25-gal. gasoline tank of lead-coated steel with welded



New Garford bus has chassis especially designed for passenger carrying service



The new Fageol inter-city stage measures only 6 ft. 3 in. from ground to roof

joints, vacuum tank, head lamps, tail and instrument board lamps and electric horn.

The chassis is sold with or without body. When the body is furnished it can be had with various seating arrangements.

The Garford Co. is also marketing another new bus known as Type I, mounted on a standard Model 15 chassis. The body is suitable for depot to hotel and similar service. It seats eleven passengers, the seats being arranged along the sides with a wide aisle and space at the right of the driver for hand baggage, the door being in the center of the right side of the body.

Another recent development in motor vehicles for carrying a considerable number of passengers takes the form of an inter-city stage designed and built by the Fageol Motors Co. especially for long-distance motor travel, which is popular in California and other parts of the country. The new vehicle is neither a truck chassis with a stage body, nor a converted touring car chassis, but is especially designed to travel long distances with comfort and safety even at high speed. As will be seen from the cuts, the coachwork and general appearance resemble that of a large closed car with running boards and individual doors giving access to each of the several seating compartments. By building a frame with front and rear kickups it has been possible to maintain a low center of gravity, with a single step for entrance and an overall height of only 6 ft. 3 in.—less than that of many closed passenger cars.

The engine used is a four-cylinder Hall-Scott, $4\frac{1}{4} \times 5\frac{1}{2}$, said to be capable of developing 62 hp. at 1800 r.p.m., the maximum governed speed. The engine has overhead valves and camshaft, pressure lubrication through hollow crankshaft and chain-driven fan through friction clutch. Delco ignition, starting and lighting system is employed.

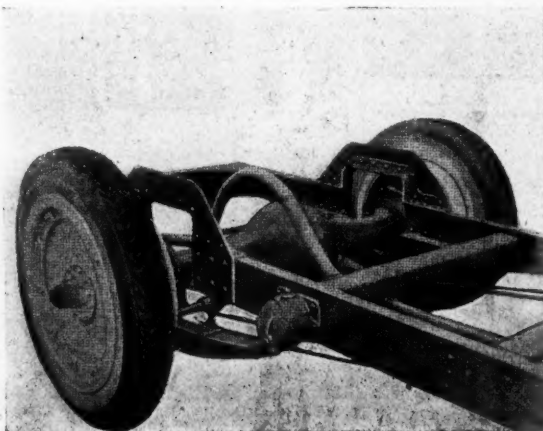
The unit powerplant includes a radiator carried on a bracket attached to the front of the engine, and a Brown-Lipe clutch and gearset. The latter has four speeds but drives direct on third speed, being over-

geared on fourth. The gear ratios are as follows: Low, 1 to 3.29; second, 1 to 1.61; fourth, 1 to 0.78. The maximum speed on the various gears is given as follows: 11.5, 23.6, 38 and 49 m.p.h. The powerplant has a three-point suspension and rests on Thermoid pads presumably intended to insulate the engine from the frame and thereby minimize the effect of vibration.

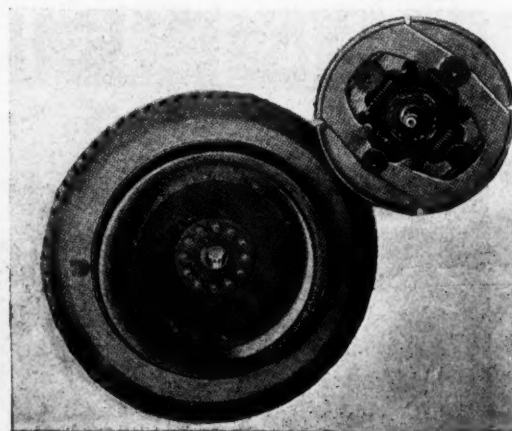
The frame, which is built up from 6-in. structural steel channel weighing 8 lb. per ft., has several cross members hot riveted in place. The propeller shaft is made in three pieces and has two bearings in center cross members. These annular ball bearings are housed in metal casings which are bolted to Thermoid fabric disks and the latter are bolted to the cross member. The fact that there is no metal-to-metal contact between bearing and cross member is said to minimize noise which would otherwise occur. The bridgework which forms the kickup over the rear axle is seen in one of the accompanying cuts. It is said to be stronger than other portions of the frame. The rear axle is a semi-floating Timken, both the worm and the springs, which are semi-elliptics, taking both torque and drive, are underslung.

The wheels, which are of the laminated wood disk type, are fitted with 21 x 4-in. drums upon which both sets of brakes bear. The brake shoes are of the Timken type but are cast from aluminum and lined with $\frac{1}{4}$ -in. asbestos-wire lining. The gear ratio is 5.2 to 1. Special provisions have been made to keep the axle oil tight.

The front axle is a drop-forged I-beam type, fitted with heavy steering knuckles. Both front and rear axles have 70-in. tread, and the tires are 36 x 6-in. pneumatics. The wide tread and low center of gravity help to increase



Rear end of Fageol stage chassis showing bridge construction of frame over rear axle



Rear wood disk wheel showing large type drum and internal shoes which are cast from aluminum

stability, and consequently the safety which has been kept in mind continually in the design of the stage. The vehicle is said to hold the road exceptionally well in rounding curves at high speed. The steering gear is a worm-and-nut type and has a 20-in. wheel.

The springs are quite flat and are made from chrome vanadium steel. Those in front have 11 leaves and measure 41 x 2½ in., while the rear springs have 10 leaves and measure 56 x 3 in. The spring brackets have oil reservoirs with wick feed and are said to require filling with oil but once a month.

Fuel is fed by Stewart vacuum system from a 30-gal. tank located between seats and over the rear axle. A six-volt storage battery is carried on the running board. Other equipment includes an extra tire and carrier and a motor-driven tire pump.

The standard wheelbase is 218 in. for a bus carrying

24 passengers, but variation in wheelbase to accommodate a body seating fewer passengers can be had if desired. The weight of chassis is given as 5700 lb., and with body complete 7300 lb.

As will be seen from accompanying cuts, the body incorporates many unusual features. The doors, which are 27 x 53 in., extend down to the running board, which is 16 in. from the ground and forms the only step. The roof and body extend out over the running board. The windows, which are of plate glass or celluloid, as desired, are arranged to completely disappear in the doors. The body framing is of white oak covered with aluminum sheet and the top is of the soft slat-type construction. There are two adjustable ventilators at the floor line and three in the roof. The interior finish is wood veneer and the seats are upholstered in genuine leather, overstuffed on special springs comparable to those used in touring cars.

Bureau of Foreign and Domestic Commerce Giving Specific Automotive Reports

American automotive firms can now obtain detailed and practical trade information concerning dealers handling automotive products in foreign countries. They can get authoritative information and contact. This has been made possible by the form of the confidential trade reports developed by Gordon Lee, Chief of the Automotive Division of the Bureau of Foreign and Domestic Commerce. This new form will contain specific and practical information such as name, address, and size of the foreign dealer; nationality; names of motor vehicles or tires handled; selling organization; storage facilities; service facilities; vulcanizing facilities; side-lines handled.

This information will not be published but can be obtained by American firms through the Automotive Division. The manufacturer will expedite his own work very greatly by making requests for all foreign trade information direct to the Automotive Division of the Bureau of Foreign and Domestic Commerce, rather than by addressing the various consuls involved.

All consular letters go through the Automotive Division and, consequently, the department is very likely to be able to answer in three days an inquiry that could be obtained from a consul only after several weeks or months.

Following is a sample form:

DEPARTMENT OF COMMERCE BUREAU OF FOREIGN AND DOMESTIC COMMERCE Washington

So far as possible the consular officers and the representatives of the Department of Commerce include in trade lists from foreign countries only firms of good repute, but no responsibility can be assumed in connection with any transaction had with the persons whose addresses are furnished. This list is NOT FOR PUBLICATION.

AUTOMOTIVE PRODUCTS—IMPORTERS AND DEALERS—SWITZERLAND (Compiled by the Commercial Intelligence Division, April, 1922)

NOTE.—Reference marks indicate relative size of firm: * small; † medium; ‡ large; no stars, no information as to size.

Name, Address and Size	Nationality	Motor Vehicles or Tires Handled	Selling Organization	Storage Facilities	Service Facilities	Vulcanizing Facilities	Side Lines
BASEL							
†A. Schlotterbeck.....	Swiss	Martini, Saurer trucks. Peugeot, Benz, Ford, Cole, Maxwell cars. Indian motorcycles.	Very good; 25 sub-dealers covering N. W. Switzerland. Exhibiting room for 10 cars.	Good; storage facilities for 20 cars.	Good; repair facilities for 5 cars; employs 7 mechanics.	None.	Various accessory lines; sells also bicycles.
†Auto Centrale, 42-44 Petergraben.....	Swiss-German	Federal trucks. Cole, Overland, Daimler cars. Dunlop tires.	Good. 10 subagents; 2 show windows.	Good; for 10 cars.	Excellent repair facilities. Employs 4 mechanics.	Yes.	Accessories and tractors.
*Alfred Lacher, 86 Alban Vorstadt.....	Swiss	Dodge cars. Harley-Davidson motorcycles. Goodyear tires.	Good. No subagents; 1 display room.	Good; 2 floors. 40 cars.	Fair; 3 mechanics.	Vulcanising outfit. Retread tires.	Accessories and garage.
GENEVA							
†J. D. Achard, 17 Rue du Rhone.....	Swiss	Buick, Dodge, Berliet, Fiat cars. Goodrich, Zee-Zee tires.	Very good; 17 subdealers covering S. W. Switzerland. Showroom for 10 cars.	Good; 3-story house can store approximately 80 cars.	Fair; can give quick service and repair 4 cars at one time; employs 15 mechanics.	Vulcanising outfit.	Various accessory lines; engaged to some extent in real estate business.
*A. Bouvet, 2 Boulevard Helvetique..	French	Peugeot, Pic-pic, Ford cars.	Fair; no subdealers. 1 show window.	Fair; 1 floor with space for 8 cars.	Not good; repair facilities for only 1 car; employ 1 mechanic.	None.	None.

At the close of 1920, operating reports showed the existence of 128 aircraft terminals of all classes, of which five were in Canada, and three others devoted to airship experiment, leaving a net of 120 in the United States. Of this number probably 20 could be classified as seaplane bases.

At the close of 1921, the operating reports showed a total of 146 air terminals, both land and water, within

the United States. All were for heavier-than-air craft. This is an increase of 26 over the preceding year. Of the total number, 30 were classified as seaplane bases. Sixteen of the 146 were publicly owned or controlled.

The 146 terminals reported available to commercial aircraft in the United States represent the facilities for 600 machines without regard to geographical or business requirements.

British Cubitt Car Designed to Compete with American Products

New British model designed for quantity production to compete with low-priced American cars in the home market. Has four cylinder $3\frac{1}{8}$ x $5\frac{1}{2}$ in. engine, four speeds, worm drive and cantilever springs.

By M. W. Bourdon

AMONG British productions the 20-hp. Cubitt chassis is of more than ordinary interest to the American industry, for it represents practically the only serious endeavor by British manufacturers to compete on a price basis in England with low-priced imported cars of the five passenger type.

Although the original Cubitt was introduced in 1919, the usual difficulties connected with the production of an entirely new model were experienced. Comparatively few cars were made during 1920, and it is safe to say that the output in 1921 did not exceed 40 chassis per week.

Late last year the chassis design was considerably modified. In size and passenger accommodation this car is to be ranged alongside such American products as the Buick Four, the Essex, Dodge and Hupmobile; in fact, with its 126 in. wheelbase it is rather more pretentious than any of these. In England its price is on a par with the above cars with the import duty added, for it sells at £467.

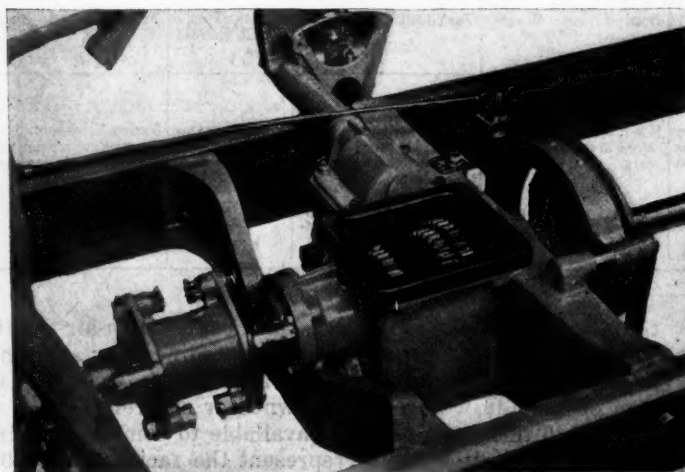
Turning to the engineering features, the frame consists of two pressed steel side members, straight and parallel in plan but slightly upturned over the rear axle; cross members comprise a cast malleable latticed member under the radiator, a tubular member on the extensions of which the rear cantilever springs are pivoted, and a pressed steel unit at the rear. The arms of the separate gearset also serve as a crossmember, and to stiffen the front horns of the side members a $1\frac{1}{2}$ in. cross tube is fitted.

The engine which is supported on the main frame at four points has $3\frac{1}{8}$ x $5\frac{1}{2}$ in. cylinders and therefore a displacement of 170 cu. in. The L-head cylinder block is formed as a unit in cast-iron with the top half of the crankcase,

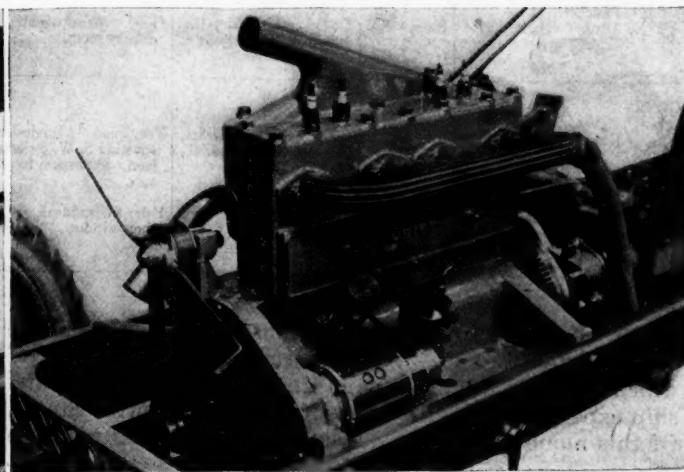
having integral arms and web extensions to obviate an underpan; the bottom half of the crankcase is also an iron casting. The detachable head, secured by 17 $\frac{7}{16}$ in. studs has the water header cast with it. Water circulation is by thermosyphon, with a cellular radiator having a nickel plated sheet brass casing and a small rear extension tank.

On the left of the engine and enclosed by a full length cover plate, the valves are operated by solid followers of $\frac{5}{8}$ in. diameter with mushroom ends and hexagon headed studs and lock-nuts for clearance adjustment. Nickel steel is used for all valves, which have a head diameter of $1\frac{7}{8}$ in., stems of $\frac{3}{8}$ in. diameter and a lift of $\frac{1}{4}$ in. The valves and followers operate directly in the unbushed cast-iron, but the three-bearing camshaft has separate bushings in the crankcase with journals of $1\frac{5}{8}$ in. diameter. The camshaft is driven through helical gearing, end thrust being taken by a flange abutting the rearmost bearing housing.

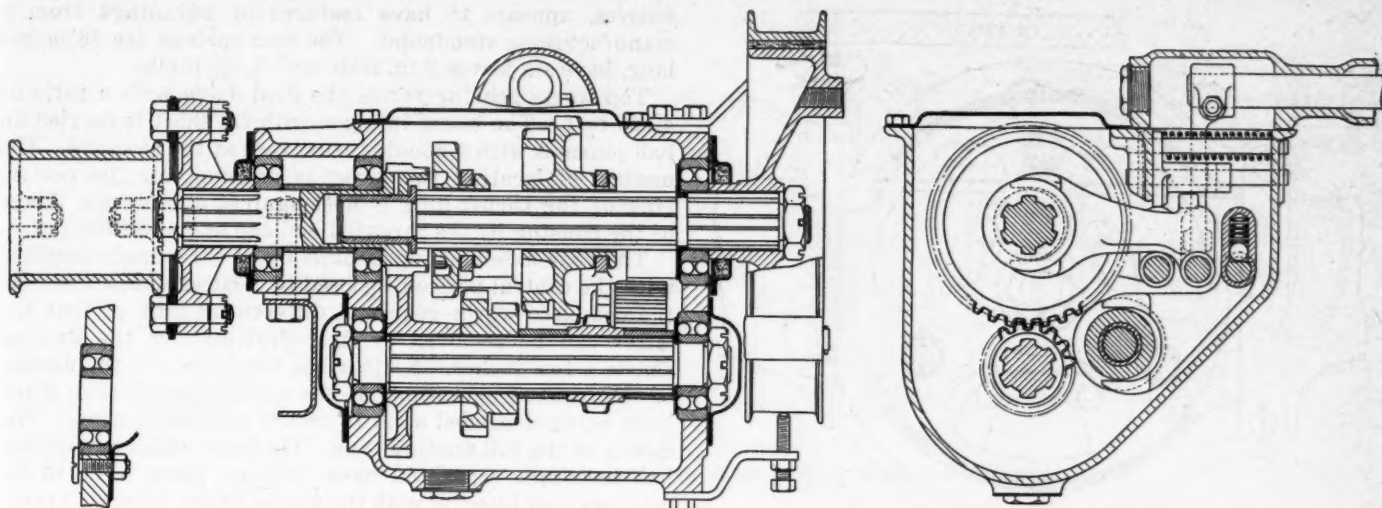
The crankshaft, machined and ground on the pins and journals only, has three die-cast white-metal bearings; both pins and journals are of $1\frac{3}{4}$ in. diameter, the front and middle journals being $2\frac{1}{4}$ in. long and the rear one 3 in. The I section connecting rods have 12 in. centers, with bronze bushes in the small-ends; the piston pin floats in piston bosses and small-end, a bronze plug at each end preventing cylinder grooving. The cast-iron pistons have two rings in the crown and a scraper in the skirt, and are comparatively short ($3\frac{1}{2}$ in.). The generator is driven by helical gearing in the distribution casing and has the ignition unit mounted on it, while the coil is mounted nearby on the crankcase. The front cover of the distribution casing is of sheet aluminum. In front of it is located the pulley



Four-speed gearset of Cubitt chassis. Note double-flexible coupling at rear end of clutch shaft



Cubitt engine left side, showing latticed cast front cross member of frame, generator, etc.



Sectional views of four speed gearset. Gear shift lever operates in a gate on the right

for the flat belt driving the two-bladed aluminum fan. On the right of the crankcase is a combined oil-filling spout and breather, also the starting motor with Bendix drive to the light cast-iron flywheel of 15 inch diameter with integral teeth.

Lubrication is on the hollow crankshaft system. The oil pump is of unusual design; it is of the plunger type and is operated by a shorteccentric strap from the camshaft. There is only one spring-loaded ball valve, on the delivery side, a suction valve being eliminated by causing the plunger to uncover inlet ports just before completing its outward stroke, when the vacuum in the pump cylinder draws up oil from the crankcase sump through an external pipe leading from a flanged fitting supporting the cylindrical filter in the sump. It is claimed that by eliminating the usual ball valve on the inlet side the most frequent cause of trouble with the plunger type of pump is removed, the high pressure on the delivery side permitting a stiffer spring to be used, so that the ball is far less liable to stick off its seat.

The clutch is of the inverted cone pattern with an aluminum male cone faced with fabric; the castiron female member is bolted to the rear face of the flywheel, the rear end of the clutch shaft carries the front two-armed spider of a double universal joint; the latter is of the type wherein four sets of flexible steel plates, instead of a fabric disk, connect the arms of driving and driven spiders.

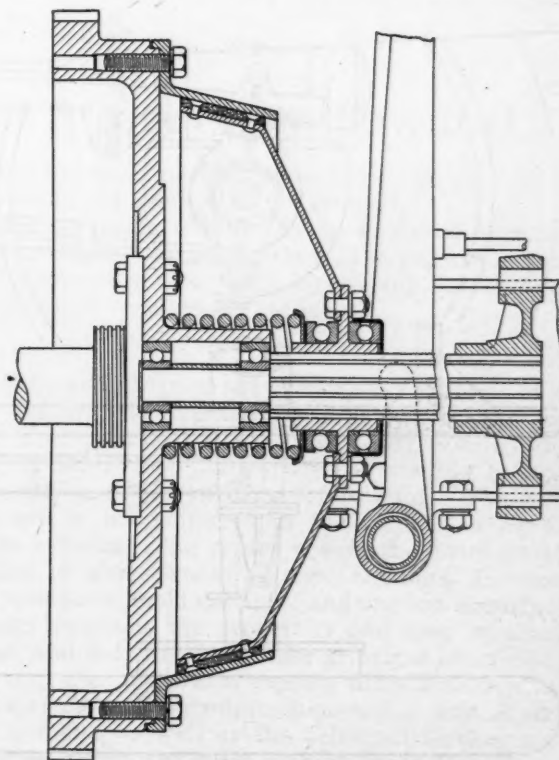
Gearset Construction

The gearset, as already mentioned, provides four speeds forward; the gear shift lever operates in a gate on the right, being supported by a tubular extension of the cover of the selector mechanism. The casing is of aluminum with two integral arms of deep inverted channel section extending from the rear end to the side members of the main frame. Excepting for the pilot, which has a plain bush, double-row self-aligning ball bearings are used throughout the gearset, the primary shaft with integral constant-mesh pinion having two such bearings separated by a distance piece $1\frac{3}{4}$ in. long. Both mainshaft and layshaft are splined, the gear sleeves on the latter being free to float axially but for distance pieces and the presence of the end bearings when the component is assembled. The mainshaft splining is continued through the rear bearing to carry the combined transmission brake drum and spider for the front universal joint of the propeller shaft; to form an abutment for the drum, a groove is turned in the splining of the shaft for a split collar between which and the drum boss the inner race of the ball bearing is pinched by

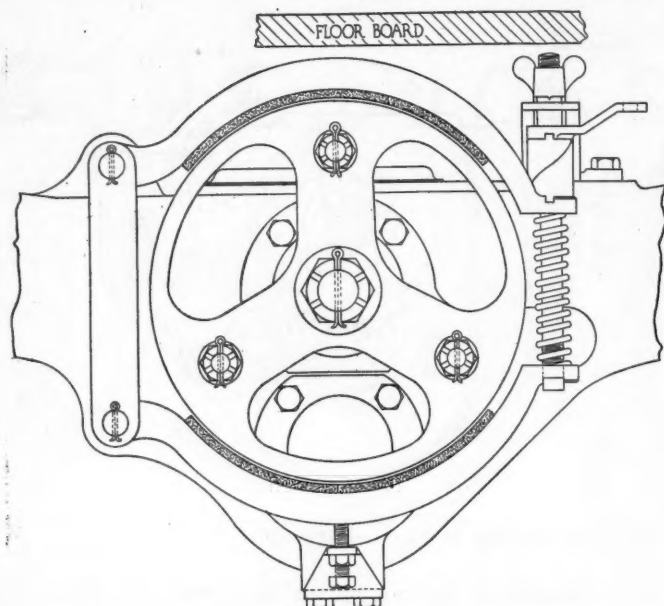
the tightening of the nut on the shaft end. To locate and secure the outer ball races of the layshaft in the straight-through machined holes of the aluminum casing, $5/16$ in. bolts with extra large round heads pass through holes drilled in the casing so that the heads within overlap the outer race, while the nuts hold steel plate washers overlapping the race on the outside; these nuts also secure the pressed steel end caps. Although this arrangement eliminates shouldered bores, it appears to open up possibilities for abuse by allowing over-tightening of the nuts to give rise to end thrust on the bearings, for the outer races project slightly within the casing.

The transmission brake back of the gearset is of the contracting type, with the fabric lined shoes actuated by a pair of helical cams on a vertical lever shaft.

Behind the gearset the transmission and suspension layout is unusual, for, in combination with an open propeller shaft having a disk universal joint at each end, are cantilever springs and tubular radius rods parallel with them



Cross section of the inverted cone type clutch



Contracting type transmission brake located back of the gearset

over their rear halves. The rear extremities of the springs have eyes located by pins passing through brackets under the axle casing, while the radius rods have ball joints at each end. The spring trunnion is a tubular cross member of 2½ in. diameter. At their front ends the springs are shackled to the brackets of the brake cross tube. Ignoring variations in spring centers due to deflection—the springs are approximately flat when loaded—this arrangement provides a parallel motion gear for the rear axle; it eliminates a torque tube and thus reduces unsprung weight; and, although not so neat in appearance as the conventional alter-

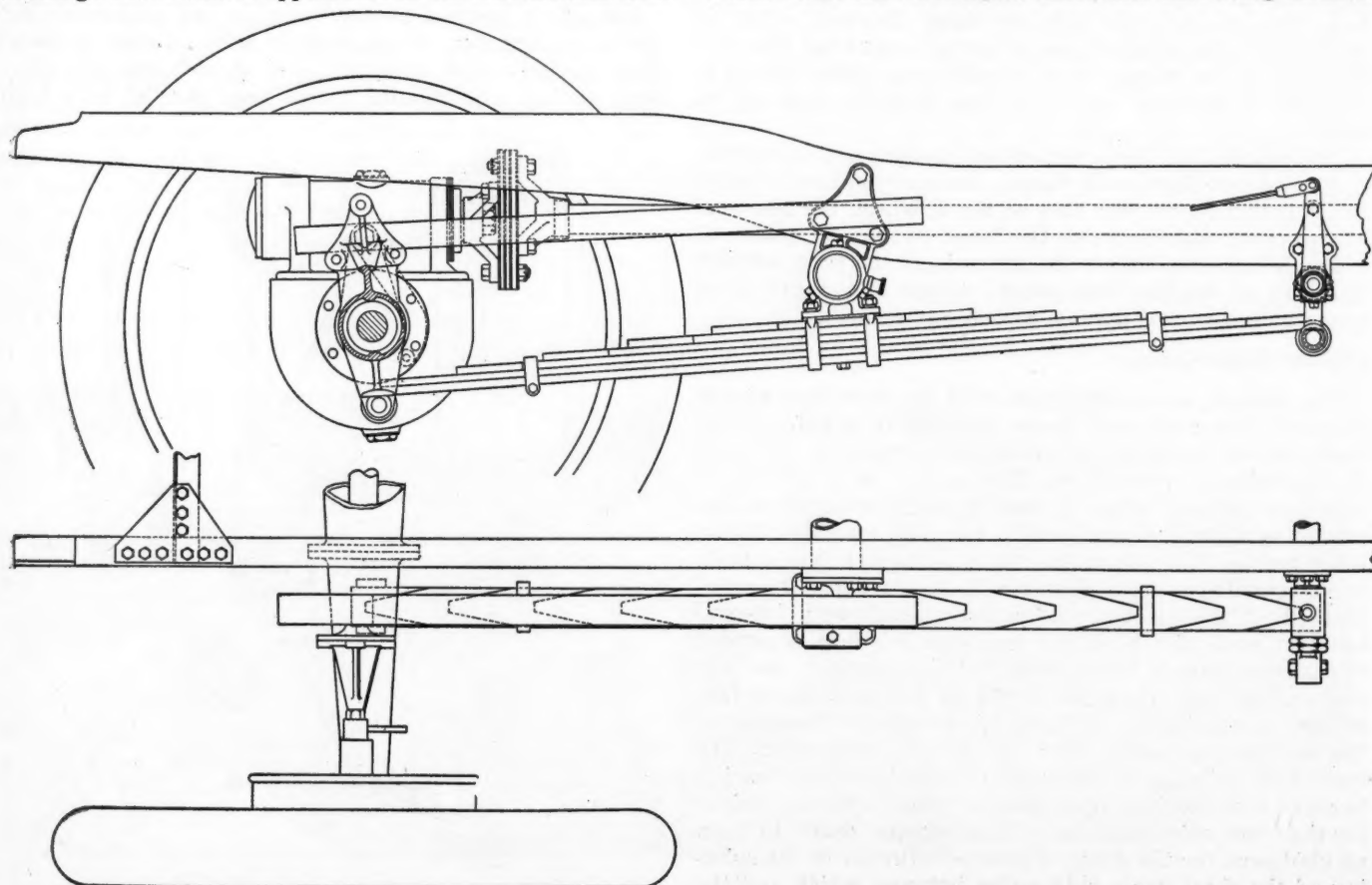
natives, appears to have features of advantage from a manufacturing standpoint. The rear springs are 48 inches long, have six leaves 2 in. wide and ⅜ in. thick.

Top worm gearing forms the final drive with a ratio of 4.125 to 1. The worm integral with its shaft is carried on ball journals with a double thrust race at the rear end. The method of locating the latter is unusual, for the central ring of the thrust unit is held against an internal flange of the housing by the threaded end-cap and a locking nut.

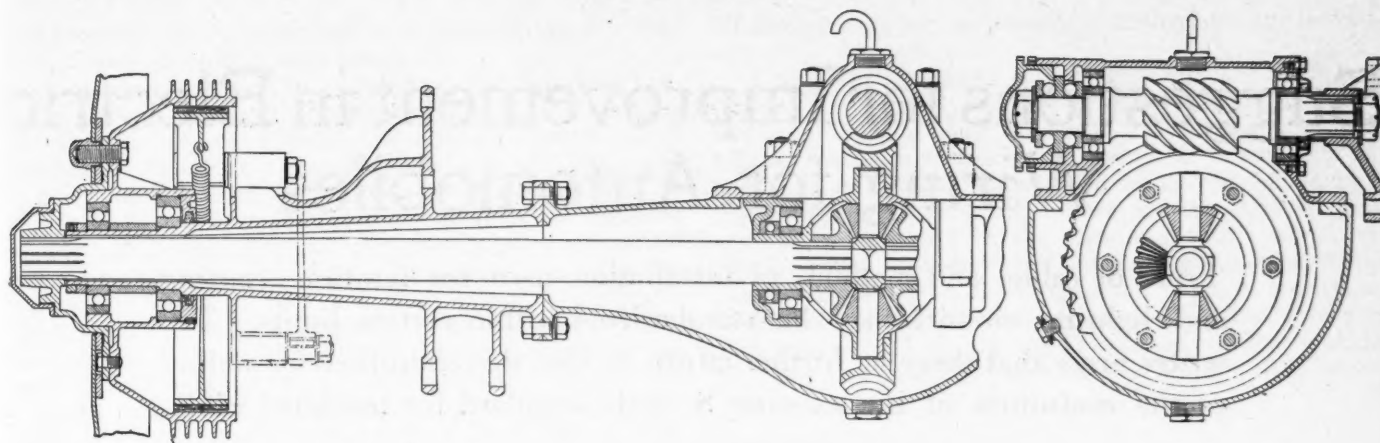
The rear axle housing is built up of three main castings with the central portion inclosed by a cover which supports the complete worm gear and differential unit so that the latter can be removed by first drawing out the driving shafts a few inches. Neither the top cover nor the flanges of the tapered extensions of the casing are piloted, fitted bolts being depended upon to secure precise location. The axle is of the full floating type. The hubs which run on two ball bearings, separated by a distance piece 1 11/16 in. long, are cast integral with the ribbed brake drums. Transmitting the drive from the splined axle shaft on each side is a peculiar unit which has an 8½ in. flange located normally between the hub flange and the disk wheel; hexagon headed bolts pass through tapped holes in the hub flange and through clearance holes in the other two parts, the outer nuts being capped and their removal permitting the disk wheel to be quickly detached. To prevent the driving unit coming away with the wheel, set screws hold it to the hub flange.

The wheel brakes are of the internal expanding pattern, cam operated with cable connections in place of rods. These brakes measure 11 by 2 in.

The steering gear is of the worm and full worm wheel pattern with a ball thrust race above and below the worm, and an adjusting sleeve and lock-nut for taking up axial play of the column. But no adjustment is provided for the worm wheel and its integral shaft, this unit being mounted



Cantilever springs with tubular radius rods parallel with them and placed over their rear halves



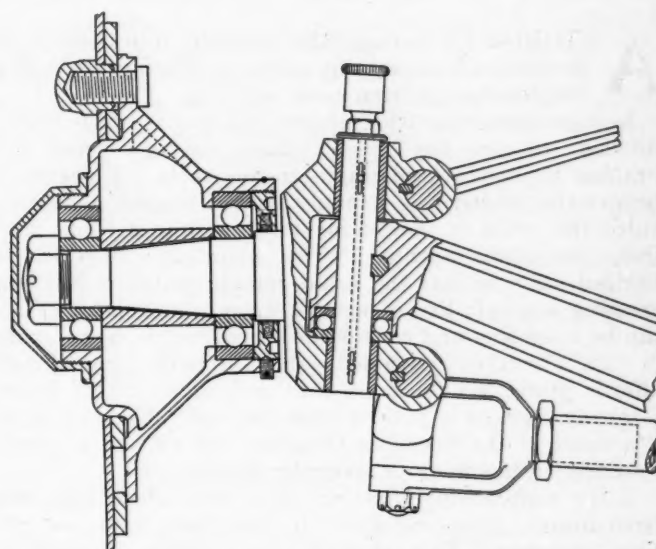
Sectional views of worm drive. Top worm gearing forms the final drive

in bearings without bushings in the steering gear casing.

The drop arm is secured to the squared end of the worm shaft by means of a pinch-bolt passing through its split boss and engaging with a groove across each corner of the square to prevent end movement. Ball joints are used for the drag link, the latter having spring loaded ends interchangeable with those of the radius rods of the rear axle.

The front axle is of the usual H section with the swivel pins secured in the ends and jawed and bushed swivel axles. Ball bearings are used for the front hubs, each of the latter being a unit casting with an outer flange for the detachable disk wheel. The steering wheel is of 17 in. diameter, the spokes, boss and rim being unit cast in aluminum, the rim coated with black xylonite. For the throttle only pedal control is provided.

The standard body is a roomy five-passenger, with leatherette upholstery, single panel screen, mahogany instrument board, and the usual folding top with side curtains. The wheelbase is 126 in., track 54 in., minimum ground clearance $10\frac{1}{2}$ in., tire size 815 x 105 mm. beaded edge, and weight of complete car 2600 lb.



Front axle and swivel pin construction

Difficulties in the Production of Alcohol from Sawdust

COMMERCIAL utilization of sawdust is made difficult by the small size of the sawdust particles and by the limited quantities available without transportation. These factors are standing in the way of chemical utilization as well as restricting the mechanical uses.

The manufacture of methyl or wood alcohol from sawdust will probably never be done on a large commercial scale. The minuteness of the wood particles causes considerable trouble in any ordinary destructive distillation process, because the stirring of the charge, which is necessary to heat the sawdust mass, results in a fine charcoal dust which clogs the condenser tubes. Then, too, the charcoal by-product, usually a considerable source of revenue in destructive distillation, is not very salable in its powdered condition. A combination of distillation and the manufacture of producer gas from sawdust avoids mechanical difficulties, and charcoal is not one of the by-products. This process might be quite successful if there were a demand for power in a locality where there is an abundance of hard wood waste. The greatest trouble with any sawdust distillation process, however, is that hardwood sawdust is not obtainable in quantities large enough to run a commercial plant without much expensive transportation, and the process, therefore, must be economical

enough to permit purchasing and grinding up large pieces of wood to use along with the sawdust.

Ethyl or grain alcohol can be produced commercially from sawdust. As yet, however, the process is practical only where there is a very large daily supply (at least 250 tons) of wood waste available.

AN investigation of the commercial methods of manufacture, together with the properties and uses of light aluminum alloys, has been undertaken by the Bureau of Mines for the purpose of making available a compendium of the existing information. The compiled data are to be published in the form of a Bureau of Mines bulletin. The report covers the commercial production of aluminum-alloy sand castings, die castings, and permanent mold castings, and worked manufactures, foundry practice, the properties and uses of aluminum alloys, and a discussion of the principal aluminum-alloy systems, e. g. aluminum-copper, aluminum-iron, aluminum-magnesium, aluminum-manganese, and aluminum-zinc systems, as well as the principal ternary systems. Patented alloys are dealt with at some length, and the preparation of various alloys taken up.

Suggestions for Improvement in Electric Wiring for Automobiles

Types of cables and methods of installation used for ignition, starting and lighting circuits may be standardized within certain limits. The writer urges that there be further efforts in that direction thereby adding to the usefulness of the existing S. A. E. standard for insulated cable.

By William S. Haggott*

AUTOMOBILE wiring falls naturally into three main divisions: High-tension ignition, lighting (including low-tension ignition) and starting.

In high-tension ignition present practice is about evenly divided between the use of plain rubber-covered and braided rubber-covered, high-tension cable. However, I believe the tendency is strongly toward braided cable provided the braid is thoroughly filled with a durable, flexible, insulating varnish. The principal objection to braided cable is that the braid retains moisture, thereby creating a possibility of erratic firing, but this objection can be overcome and considerable progress is being made in this direction. Braided cable, properly constructed, affords protection from oil, heat and ozone, all of which seriously damage a plain rubber-covered cable. Ozone is the worst of the three, as it causes the rubber to crack, resulting in misfiring or irregular firing.

If the high-tension wires are short and can be kept free from injury, it is preferable to run them open and not close together. This method gives positive protection against inductive disturbances and leakage between wires and will prevent "cross-firing." I believe that in a good many cases the spark-plug wires can be run open to good advantage, but there are instances, especially in connection with six, eight and twelve-cylinder engines, some of which have two spark-plugs per cylinder, where it is practically necessary to run the wires in tubes.

Metal tubes are usually used for this purpose on account of cost. A fiber tube would be better, as it prevents leakage to the ground in case the cable insulation fails. In order to nullify the condenser action when a fiber tube is used, it is only necessary to run a bare wire through the tube and ground this wire to the engine. Where a metal tube is used it must be well grounded to the engine so as to carry any static or condenser effect to the ground. The openings in a metal tube must be properly rounded or bushed to prevent cutting the cable insulation.

If possible, the coil of battery-ignition systems should be located close to the distributor, thereby keeping the wire from the coil to the distributor short. Where a tube is used for the spark-plug wires, it is best to keep the wire from the coil to the distributor out of the tube.

Lighting and Low-Tension Ignition

There is a strong tendency toward the use of armored cable on lighting circuits. This is particularly true where wires are exposed and subject to chafing. Armored cable, if properly constructed and installed, will give no trouble. The most important factor in the use of armored cable is

to be sure the armor is stripped back sufficiently from the terminals, and then soldered down so that a ground cannot occur at these points. Rubber covered and braided or varnished cambric and braided cable protected by flexible metallic conduit is sometimes preferred. There is also some use of non-metallic conduit to carry these types of wire. The use of metallic conduit perhaps gives a more substantial appearance on head and tail-lamp wires, but is more expensive than armored cable from the standpoint of first cost as well as that of installation.

It is, of course, unnecessary to have metallic protection for wiring around the instrument board. As a matter of fact, I have several installations in mind where rubber covered and braided cables have been used for years on all circuits, including head and tail-lamps, without the use of additional protection, but I believe the use of armored cable is good insurance against lighting-circuit failures.

Spliced or Separate Head-Lamp Wires

The question came up recently as to the advisability of running separate head-lamp feed wires from each head-lamp clear back to the lighting switch, instead of making a splice at a point near the front end of the car and having only one wire from the switch to the point of making the splice. This latter method has practically become standard, and I think should be so considered. The splice can be properly made and supported, and when so constructed will give no trouble.

It is better not to wire instrument-lamps in series with tail-lamps as is sometimes done. The only advantage in the series arrangement is to indicate when the tail-lamp is burned out, and this fact can be checked up easily by looking back for the reflection of the tail-lamp. With tail and instrument-lamps in series, it is necessary to use 3-volt bulbs, which are rather special and sometimes hard to obtain. The series arrangement also requires continuous burning of the instrument-lamp, which is fatiguing to the driver's eyes. With separately controlled lamps, the instrument-lamp can be turned out when the car is parked, and can be substituted for the tail-lamp if it should burn out.

Where fuses are used each circuit should be protected, even though this is slightly more expensive than to have one fuse control several circuits. With each circuit fused separately it is easier to locate trouble, and, when circumstances require, it is possible to operate the car with one circuit out of commission. Considerable attention is being given to the use of a single-circuit breaker placed in the main battery feed circuit. This method of protection has the advantage that when the cause of trouble is removed the circuit-breaker can be closed and the car

*Cable sales manager, Packard Electric Co. Paper presented before the S.A.E. Buffalo Section Meeting, condensed.

can proceed without resorting to the installation of make-shift fuses, which is always dangerous.

It is good practice to consolidate lighting and low-tension wires wherever possible and braid them together or run several wires through one piece of conduit. This method is economical, convenient, and tends toward rugged and safe installations. If proper wire is used and the individual wires are assembled together in a workmanlike manner, installations of this sort give little or no trouble from a repair shop standpoint. This use of assemblies or wiring harnesses, as they are often called, is admirable from a car assembly standpoint. The wiring harnesses are formed up on a bench, which permits uniformity and careful workmanship and a more satisfactory wiring job.

Right here I would like to suggest that some effort be made to adopt a standard color scheme for various circuits on all cars. For example, every car has a wire running from the battery or starting switch to the ammeter. Is there any reason why a certain definite color cannot be assigned to this and other wires which are common to all cars, and have as nearly as possible a standard wiring color scheme among all car manufacturers? It seems that this would be of great value to the car driver and repair man and provide a uniformity which would be helpful to the industry in many ways.

Starting

The most general practice is to use rubber-covered and braided cable. On 6-volt systems No. 1 A. W. G. wire is the prevailing size, although there is quite a little No. 0 and some No. 2. The gage size is important in order that proper starting torque may be delivered by the starting motor in cold weather. Starting-motor cables should in

all cases be as short as possible, thereby keeping the voltage drop to a minimum.

If the starting-motor cables are short and well supported, they will in many cases need no additional protection such as conduit or armor. Non-metallic conduit affords excellent protection if chafing or mechanical injury must be guarded against. If metallic conduit is used, great care must be taken to prevent the conduit from coming in contact with the terminals. This same precaution must be observed if an armored starting-motor cable is installed. A most important point in connection with starting-motor cables is to see that the battery is well grounded. I believe a good standard method would be to use a two-hole lug which can be firmly bolted to the frame.

Terminals

It is impossible to use too much care in attaching and soldering terminals. Wherever spade-type terminals are used, they should have two sets of wings, one pair to grip the insulation and the other pair to grip the copper core. I am greatly in favor of soldering terminals wherever possible, thus insuring a proper electrical connection. There are some types of terminals and lamp connectors which cannot be soldered, but I am strongly inclined toward soldered terminals, and would like to see the solderless types used only in cases where soldered terminals are not at all feasible.

I believe it is possible to so arrange the electric wiring and the various parts of the gasoline supply equipment that no gasoline can leak on any part of the electrical equipment that is liable to emit sparks. If this is done, one of the greatest fire risks is eliminated.

Electric Furnace vs. Open Hearth Silico-Manganese Spring Steels

IT is more or less generally recognized that steels of the same composition in so far as the elements used are concerned require variations in heat treatment to produce similar properties. This applies to comparisons between heats made by the same type of process and steels produced by different processes. A series of tests was completed at the Bureau of Standards the past month on samples of electric and open-hearth heats of silico manganese spring steels carrying equal proportions of C, Mn, P, S, and Si. The tests included microscopic examination, tensile test, and determination of proportions of certain gases present, particularly nitrogen and hydrogen. In general, the microstructure of the electric steel was some-

what different from that observed in the open-hearth when both steels were subjected to the same heat treatment.

Under certain thermal treatments, distinct differences in tensile properties were observed, but these were largely obliterated by a preliminary normalizing quench from a high temperature. It was found that the proportion of oxygen present in these steels was practically the same, about 0.028 per cent, and independent of the heat treatment applied. The nitrogen in the original rolled samples of electric steel was approximately twice that of the open-hearth and independent of the heat treatment. However, in the case of the electric steel, the proportions of nitrogen were dependent upon the heat treatment.

A New Spring Retainer

A SIMPLE type of valve spring retainer which is designed to replace the cup and spring type, has been brought out by the Master Primer Co. This is a one-piece unit which locks itself in place when the spring is compressed. It is claimed that the new type of retainer gives a 100 per cent bearing around the valve stem and, consequently, holds the valve squarely on its seat, and does not allow the valve spring to cock to one side or the other.

In assembling, the pressure on the retainer opens the self-locking wings because the valve stem is of larger diameter than the hole through the wings. When the spring is fully compressed, the wings are caught in the groove of the stem and release of the spring compression snaps the wings into a locked position on the stem, forcing



Master Valve Spring Retainer

the cup and wings of the retainer together.

To disassemble, with the spring fully compressed, the locking wing is spread sufficiently to enable them to slip out of the groove. Release of pressure on the spring then pushes the retainer off of the valve stem. It is claimed that the cost of the retainer is less than the articles replaced. It is also claimed that a saving is effected by speed of assembly.

Federal Government Revises Petroleum Specifications

Color test only change of importance in respect to motor gasoline. Points on distillation curve unchanged. Viscosity limits on lubricating oils are altered and some minor changes are made in other items. Tests show that most gasolines now marketed are well under Federal limits as to volatility.

CHANGES made recently in the Federal Government specifications for motor gasoline and lubricating oils do not materially alter the specifications formerly employed, but since these specifications are widely used by many large purchasers of petroleum products they are important to the automotive industry. The changes in respect to motor gasoline do not affect the distillation temperature limits, but make the color test more specific. Surveys by the Bureau of Mines show that the average gasoline marketed to-day are well within the Federal specifications, although some California gasolines have a darker color than is stipulated in the latest requirement under this head.

The specifications cover a wide variety of products, including aviation gasolines, motor gasoline, naphthas, kerosene, fuel oils of various grades,* lubricating oils and greases of numerous different grades, etc. We give below only the specifications for motor gasoline and for Class D lubricating oils intended for use in all internal combustion engines except aircraft, air-cooled and Diesel type engines.

The new specifications, which are similar in character to those adopted during the war by the Committee on Standardization of Petroleum Specifications, have been adopted by the Federal Specification Board and have been published as Technical Paper No. 305 of the Bureau of Mines. These specifications are widely used, not only by the Federal and many State and local Governments, but by other large purchasers of petroleum products. Because of this fact they have a considerable effect upon refinery practice, although a large proportion of refinery products are not in strict agreement with them. They serve, however, as an excellent guide to purchasers who heretofore have often been more or less at the mercy of the oil companies for lack of knowledge as to what constituted a good specification.

Specifications for Motor Gasoline

1. This specification covers the grade of gasoline used by the United States Government and its agencies as a fuel for automobile, motor boat and similar engines.
2. **Color.**—Method 10.1. The color shall not be darker than No. 16 Saybolt.
3. **Corrosion test.**—Method 530.2. A clean copper strip shall not be discolored when submerged in the gasoline for 3 hours at 122 deg. Fahr.
4. **Distillation range.**—Method 100.1. When the first drop has been recovered in the graduated receiver, the thermometer shall not read more than 60 deg. C. (140 deg. Fahr.).

*For complete specifications of all products see Technical Paper No. 305 of the Bureau of Mines, procurable from the Bureau or the Superintendent of Documents, Government Printing Office, Washington.

When 20 per cent has been recovered in the receiver, the thermometer shall not read more than 105 deg. C. (221 deg. Fahr.).

When 50 per cent has been recovered in the receiver, the thermometer shall not read more than 140 deg. C. (284 deg. Fahr.).

When 90 per cent has been recovered in the receiver, the thermometer shall not read more than 190 deg. C. (374 deg. Fahr.).

The end point shall not be higher than 225 deg. C. (437 deg. Fahr.).

At least 95 per cent shall be recovered as distillate in the receiver from the distillation.

5. All tests shall be made according to the methods for testing petroleum products adopted by the Interdepartmental Petroleum Specifications Committee. (See Technical Paper 298, Bureau of Mines.)

The foregoing specification is substantially identical with that formerly used except that the color is more specifically defined.

The following specification for lubricating oils, designated as Class D is similar in most respects to the specifications for oils formerly known as Class C. However, the following among other slight differences are worthy of note:

Reference to the inclusion of fatty oils and other compounds not derived from crude petroleum is omitted.

The viscosity limits on all five grades have been slightly altered.

The color specification now provides for mixing the oil with an equal volume of water white kerosene before color comparison is made.

The corrosion and emulsifying specifications are slightly altered.

Specifications for Engine Lubricating Oil

1. This specification covers the grades of petroleum oil used by the United States Government and its agencies for lubrication of internal-combustion engines, except aircraft, air-cooled and Diesel engines.
2. These oils shall be supplied in five grades, known as extra light, light, medium, heavy and extra heavy.
3. **Flash and fire points.**—Method 110.3. The flash and fire points of the five grades shall not be lower than the following:

Grade	Flash point, Fire point, deg. Fahr. deg. Fahr.	
	Flash point, deg. Fahr.	Fire point, deg. Fahr.
Extra light	315	355
Light	325	365
Medium	335	380
Heavy	345	390
Extra heavy	355	400

4. **Viscosity.**—Method 30.1. The viscosity of the five

grades at 100 deg. Fahr. shall be within the following limits:

	Seconds
Extra light	135-165
Light	180-220
Medium	270-330
Heavy	360-440
Extra heavy	450-550

5. **Color.**—The color of the extra heavy grade, when mixed with an equal volume of water-white kerosene, shall not be darker than No. 6 National Petroleum Association standard, or its equivalent. The color of the other grades, when mixed with an equal volume of water-white kerosene, shall not be darker than No. 5 National Petroleum Association standard, or its equivalent.

6. **Pour point.**—Method 20.1. The pour point shall not be above the following temperatures:

	Deg. Fahr.
Extra Light	35
Light	35
Medium	40
Heavy	45
Extra heavy	50

7. **Acidity.**—Method 510.3. Not more than 0.30 mg. of potassium hydroxide shall be required to neutralize 1 gram of the oil.

8. **Corrosion.**—Method 530.3. A clean copper strip shall not be discolored when submerged in the oil for 3 hours at 212 deg. Fahr.

9. **Carbon residue.**—Method 500.1. The carbon residue shall not exceed the following:

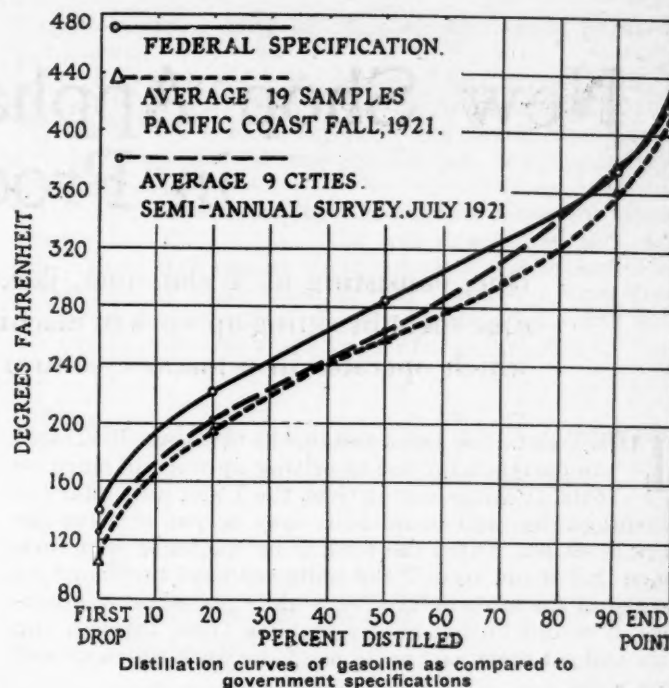
	Per cent
Extra light	0.10
Light .....	.20
Medium .....	.30
Heavy .....	.40
Extra heavy .....	.60

10. If especially required by the department purchasing the oils, the demulsibility (grades extra light, light and medium—method 320.3, grades heavy and extra heavy—method 320.4) shall not be less than 300, and the upper layer at the end of thirty minutes shall not contain more than 5.0 per cent of water.—Method 300.4.

11. All tests shall be made according to the methods for testing petroleum products adopted by the Interdepartmental Petroleum Specifications Committee. (See Technical Paper 298, Bureau of Mines.)

California Gasolines

The Bureau of Mines is making a survey of petroleum products manufactured on the Pacific Coast from California crude oils. California crude petroleum is known



to differ in some characteristics from the crude oil produced in other parts of the United States, and the claim has been made that the present Federal specifications are unduly severe when applied to the products made from California crudes. The main purpose of the present survey is to determine whether these claims are justified.

This report deals only with California gasolines. Other products, such as burning oil, fuel and lubricating oils, will be taken up later.

The samples of gasoline reported upon were furnished in most cases by the four large refining companies located on the Pacific Coast, although a number of samples of motor gasoline were purchased in the open market.

The methods of analysis are, in general, those which were adopted by the Committee on Standardization of Petroleum Specifications and printed in Bulletin No. 5 of this Committee. Bulletin 5 has been revised recently.

The results of the survey indicate that the samples of California motor gasoline met the specifications in respect to volatility, as shown by the distillation curves in the accompanying cut, as well as in other respects, except that several samples were off in color, as now specifically defined.

Recent Developments in the Work of the Advisory Board on Highway Research

THE main activities in the Advisory Board since last July have been in the contacts made with potential research agencies, such as the State highway commissions and the Bureau of Public Roads, in the writing of papers, in giving addresses to quicken the will to research of those who are interested in highway development, in tying together the committees of the organizations (that are milling around) in this field.

Additional constituent organizations have been added to the Advisory Board as follows:

Bureau of Standards, Western Society of Engineers, Eno Foundation for Highway Traffic Regulation, Associated General Contractors of America, Rubber Association of America.

A comprehensive program of highway research has been

drawn up, and the highway research census is being taken, and the data from the researches collected. All of this material will be filed under the code numbers attached to the program. The list of research workers will be transferred to the personnel files of the Research Information Service of the National Research Council.

New committees of the Advisory Board authorized are: Highway Finance, Highway Traffic Analysis, Maintenance, Highway Bridges.

The personnel of the existing committees has been reviewed with the purpose of vitalizing the work of these committees, and the membership of new committees is under discussion. An administrative assistant has been supplied to Mr. H. S. Mattimore, chairman of the Committee on Character and Use of Road Materials.

New Shop Appliances Save Time in Production

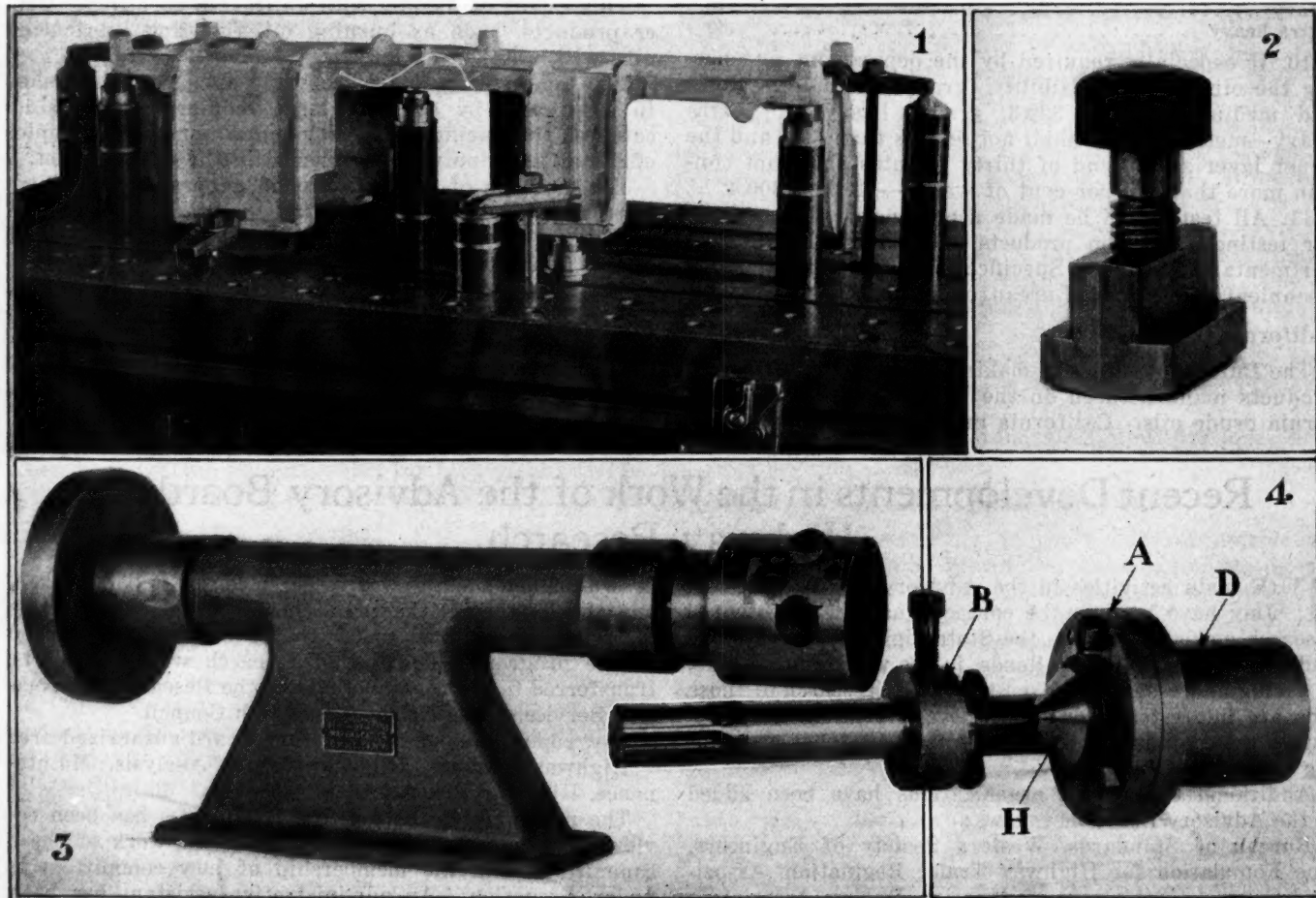
One, consisting of T slot nuts, jacks and blocks, is designed for reducing time spent in setting up work in machine tools. Another is a reamer holder which operates in a manner contrary to that of the floating type reamer.

THE T slot nuts, jacks and blocks herewith illustrated are designed for use in setting up work in machine tools. Besides saving time, the T slot nuts offer the advantage that additional bolts may be put in after the work is set up. Often the work to be machined is of such shape that if old style T slot bolts are used they must be located in the table before the work is placed on it, otherwise it would be impossible to slide them through the slots and get them past portions of the work which extend over slots.

The Casler T slot nut is claimed to present ample wearing surface, and not to injure T slots, and while it must be inserted from the end of the slot it does not necessitate disturbing the work in order to add one or more extra bolts at any time during the machining operation. The studs used in connection with this nut are easily made. The nuts are made in a large range of sizes.

The jack and blocks furnish a ready means of leveling up the work, and the blocks are claimed to save many trips to the wood shop after wood blocking. The outfit consists of three elements, a jack, block and pipe extensions. The jack screw is made with a point and a flat surface at opposite ends. The screw can be reversed to bring either end in contact with the work. The jack body is also reversible and is provided with a flange which permits it to be used with tubular extensions. The flange is so located and the tubular extensions are of such length that when combined any height between the maximum and minimum may be reached with the jack. Without tubular extensions the jack has a minimum height of $1\frac{3}{4}$ in. when using the point for supporting the work and $1\frac{1}{2}$ in. when using a flat surface for the purpose.

The screw has an extension of $\frac{5}{8}$ in. and is of such pitch and diameter that it will not run down when a



1—Application of T slot nuts, jacks and blocks. 2—Casler T slot nut. 3—The Casler lapping and filing lathe. 4—The complete Casler reamer holder fitted to adapter for use in Jones & Lamson turret lathe

chattering cut is taken on the machine. When two or more tubular extensions are used with the jack, these are held in position by one or more of the blocks.

The Casler reamer holder was designed on the theory that in order to ream a straight, true hole it is necessary to hold the rear end of the reamer concentric with the spindle and with the hole to be reamed. The illustration shows the reamer holder complete and fitted to a sleeve or adapter *D* for use in a Jones & Lamson turret lathe. *A* is a face plate of machine steel, pack hardened and ground; *B* is the reamer holding collar of machine steel pack hardened and ground; *D* is a bushing or adapter of cast iron which fits the tool holder on the turret; *H* is a cone-

shaped centering plug of machine steel, pack hardened and ground.

The theory on which the design of this reamer holder is based is contrary to that of the floating reamer, and it is claimed by the manufacturers of the device, the Marvin & Casler Co., that floating reamers are being abandoned by manufacturers.

One of the accompanying illustrations shows the Casler lapping and filing lathe. The tool is equipped with ball bearings at each end of the spindle and was designed for use in lapping small holes, thereby taking the work from a more expensive lathe. It may be equipped either with the twin screw drill chuck or the three jaw chuck.

Special Tariff in Effect for Czecho-Slovakian Automobile Factories

A NEW regulation of the additional duties has been announced for Czecho-Slovakia in effect from Jan. 1, 1922. The customs tariff itself has not been changed, but the coefficients for the single tariff positions have been increased very much and the highest coefficient at present used is 30. The duty to be paid is calculated in such a manner that the original or fundamental duty is multiplied by the corresponding coefficient. The exchange value of the Czecho-Slovakian krone is oscillating like the German mark and the custom tariff with such fixed coefficients cannot be an ideal one. In every case it will be a protection against the competition of the countries with low exchange value like Germany and Austria, for the average addition of duties is 70 to 200 per cent and more. In the following table the original duty and the old and new coefficients are represented for comparison. As evident from reference to the single tariff numbers, the Czecho-Slovakian automobile factories have a special tariff.

Tariff number	Designation of ware	Original duty in kronen for 100 kilograms	Coeficient New	Old
320 e2	Casings and air tubes for automobiles and motor cycles.....	150	20	16
445	Sheet ware:			
	(a) Raw sheet iron.....	18	16	10
	(b) Sheet iron, coarsely painted	23	16	10
	Remark to No. 445: Pressed or stamped sheet ware, like frames, running boards, wheels, rims, tires for automobile factories with special allowance under special conditions .....	..	5	..
471	Springs:			
	(b) Other springs, also for automobiles	21	16	7
	Remark to No. 471: Automobile springs for automobile factories with special allowance, etc.	21	5	7
483	Wrought iron ware, also in connection with cast iron and wood:			
	(a) Raw or scrubbed or coarsely painted, with a piece weight:			
	(1) Of more than 25 kilograms	10	16	7
	(2) Of more than 3 to 25 kilograms ..	12	16	7
	(3) Of more than 0.5 to 3 kilograms..	14	16	7
	(4) Of 0.5 kilogram or less	16	16	7

Tariff number	Designation of ware	Original duty in kronen for 100 kilograms	Coeficient New	Old
483 c.	Remark to No. 483a 1-4: Fittings for automobile factories with special allowance, etc...	..	9	7
	Ball bearings, except to those for cycles, well machined, with a piece weight:			
	(1) Of more than 25 kilograms	30	3	7
	(2) Of more than 3 to 25 kilograms	32	3	7
	(3) Of more than 0.5 to 3 kilograms	36	3	7
	(4) Of 0.5 kilograms and less	40	3	7
539	Dynamos and electromotors also in inseparable connection with mechanical devices and apparatus, with a piece weight:			
	(1) Of 25 kilograms or less..	72	30	7
	(2) Of more than 25 to 500 kilograms	50	30	13
	(3) Of more than 500 to 3000 kilograms	43	30	13
	(4) Of more than 3000 to 8000 kilograms	36	30	13
	(5) Over 8000 kilograms....	24	30	13
553	Remark No. 539: For starting, ignition and lighting devices for automobiles .....	..	3	..
	Automobiles, motor cycles, chassis with or without engine, with or without body, and bodies, imported apart without considering the weight...	65% ad valorem	..	..
554	Engines for motor vehicles, at separate transport:			
	(a) Airplane engines	15,000	1	..
	(b) Other engines:			
	(1) Up to 50 kilograms..	6,000	1	..
	(2) From 50 up to 250 kilograms	5,500	1	..
	(3) From 250 up to 500 kilograms	5,000	1	..
	(4) More than 500 kilograms	4,500	1	..
	Remark to No. 554: Single parts of these engines, all over machined and imported apart, have to pay the same duty like the whole engine, if the importer proves the fact, that this part belongs to an engine of corresponding species and corresponding weight. If the importer cannot prove that, then the parts have to pay the duty for Number 554 a resp. b. l.			

Tractor Service Has Been Neglected —It Must Be Improved

Research is necessary to determine service costs. Operators and oils are "trouble twins" of tractor service. Education in tractor operation needed to reduce maintenance difficulties. Tractor maker must approximate service practice of automobile manufacturers. The views of a tractor man.

By G. M. Gillette*

IN my opinion the matter of field service on threshers and tractors has not received the attention from manufacturers which it demands. Manufacturers spend thousands in engineering to effect savings in design and other thousands for special machines to accomplish a saving of a few cents each in the cost of manufacture of a part of a machine, while service in the field, which in many cases represents nearly as much as the total cost of direct labor employed in the manufacture of machines, is given little attention.

By service, as here discussed, I mean the labor, material and attention which is given to machines after passing into the hands of the purchaser.

If I should now ask the various manufacturers present as to the average cost of such service in the year 1921, based on the number of machines sold in 1921, I doubt if many could answer, and I also doubt whether you could give the ratio or percentage of service cost to the manufacturing cost of your machine. Nor do I believe there is a uniformity of practice in apportioning the cost of service. Some may add this cost of service to the manufacturing cost, others may include it as a part of sales expense, while still others would attempt to subtract it from the residue of profits which now do not exist.

Field Service Division

Field service should probably be considered under two heads:

- (a) Service which should be gratuitous.
- (b) Service which should be paid for.

Many abuses have grown up under the customs of the trade. Competition has increased gratuitous service, especially on tractors, to an unwarranted degree. The farmer has been encouraged to make unreasonable demands. The causes of this are in part that manufacturers have put out machines that are not entirely perfected. Salesmen have over-sold their goods and made unwarranted promises. Varying conditions, soil, moisture, etc., have created unexpected troubles.

Some of the demands for service are being lessened. Ignition troubles are less frequent than a few years ago. Gear troubles are disappearing with the adoption of better materials, better workmanship and heat treatment. Carburetion troubles are not over on machines burning gasoline only by reason of the lowering of the quality of the fuel, and in the burning of the lower grades of fuels perfection has not yet been attained.

*Paper read before Tractor and Thresher Department of the National Association of Farm Equipment Manufacturers.

I would consider oiling systems, and the varying quality of the oils used in lubrication, to be one of the principal sources of tractor troubles to-day, not attributable to the manufacturer, but largely to the user and to the oil situation, and to the false economy used in attempting to get away with poor oil.

Other reasons for demands for excess service arise not from the warranties, but from demands beyond the terms of warranty and lack of adherence to a uniform well-established sales and business policy, but in my judgment the greatest cause of demands for excess service arise from the fact that there are too many incompetent operators driving tractors. I am inclined to believe that the two O's, operators and oils, are the "trouble twins" of service.

In view of the known present excess cost of service, is it not fitting that we should attempt to find a remedy? Let us consider:

First, shall the present method of handling service be continued by the manufacturers themselves?

Second, is it possible to devise a means by which service may be delegated to independent service organizations?

Duties of the Service Department

If the present service system is still to be maintained by the manufacturer, what should be the duties of such a service department?

1. It should participate with the Engineering Department in the testing of any new models. I believe the experience of all manufacturers will sustain the contention that the Service Department should participate in the actual tests and operations of new models as its criticism will be of value and effect ultimate economies.
2. It should conduct demonstrations in co-operation with the Engineering Department. I say this, for in my opinion the operators should be under one control.
3. It should advise the Sales Department of new uses to which tractors may be put.
4. It should service the user, the owner and the operator, as well as the machine.
5. It should have a part in the production of instruction books to users.
6. I am in doubt whether the Service Department should be under the jurisdiction of the Sales Department or not. There are arguments on both sides.
7. Service cannot be divorced from sales, and frequently service men are of the greatest value to salesmen.

I am a strong believer that a service man should possess the germs of salesmanship, and that he should also be inoculated with the virus of the Collection Depart-

ment. At times it is not less important that he should have the diplomacy of an adjuster. Not infrequently upon the service man's report, or on his opinion, must rest the determination whether service should be paid for by the user or furnished gratis; or whether a free replacement should be made, or whether it should be paid for.

The service department should thoroughly educate its operators. It should also instruct the dealers and when a manufacturer's service man makes a delivery he should thoroughly instruct the buyer and operator.

The development of the tractor and thresher has not as yet reached such a state of perfection, either in design or shop workmanship, that gratuitous field service is absolutely unnecessary, and that occasions do not arise where errors should be charged back to the engineering or operating department, and gratuitous service must be furnished the buyer.

I wish I had statistical information which I might furnish you, showing how much greater is the demand for free service and gratuitous replacements on machines sold on time than on machines sold for cash, but the experience of our competitors is different from our own if they have not found that the most unreasonable demands come from those who have only made a small payment on their machine, rather than from those who own and have actually paid for their machine.

I also believe that the service department, in conjunction with the engineering department, should direct and operate schools of instruction for operators and users. Some of you do this, I believe, with excellent results.

I believe most of us have outgrown the old idea and the old sales talk that anyone can operate a tractor. The sooner we learn and the sooner the users learn that any machine requires intelligent use and good care and careful watching, the sooner will we see a decline in the demand for unnecessary service and the sooner will we see a more profitable use of the machine by the buyer. Every move made to educate the buyer and the user to give a machine better care and more intelligent use will result in an increased demand.

All the above things, in my judgment, must be accomplished by the service department if it fulfills its functions, if the manufacturer is to continue to perform the field service as in the past, and many of these things must be done by the manufacturer whether he continues field service in the present manner or not.

Let us now turn to the second phase and consider whether it is practical for the manufacturer, either through his branch houses and his own operatives, or through the dealer, to abandon field service and to turn its functions over to independent service organizations. I am not yet thoroughly convinced that such a plan is widely practicable. I am convinced that in many territories it is entirely practicable. Such a plan, however, can be successful only if it has the hearty support and co-operation of all manufacturers and most of the dealers in the territory where it is tried.

There is an enormous waste in the present system, not only from the abuses which have been heretofore indicated, arising from unreasonable demands and lack of intelligent operation, but in territories where various manufacturers have just begun to operate and have as yet but very few machines. There are many territories in the country where a large number of organizations maintain service departments which are not kept busy, but which, nevertheless, they are obliged to maintain to give necessary service and to meet the conditions which their competitors impose.

Difficulties surround the attempt to entrust service to independent service organizations.

1. There is a lack of confidence among the manufacturers in each other. They fear that service would not be impartial, or else they fear that it would be.

2. The difficulty of finding garages or service stations familiar with various makes of tractors and their peculiarities and competent to perform the service.

3. The impossibility of getting an independent service man to service the user and operator as well as the machine.

4. The difficulty of properly working out detailed arrangements for supplying spare parts.

5. The difficulty of securing the co-operation of dealers in a given locality as some dealers would have service facilities and desire to use them, while other dealers would not.

6. The difficulty of entrusting to an independent dealer the question of adjustments and the determination of whether replacements should be gratis or paid for.

7. Finally, whether the dealer would give proper instructions to owners and operators which would leave them as well satisfied as with the manufacturer's own service department. On the other hand, if in certain territories service could be thus entrusted, it is my judgment the industry would find it a great economy.

When we get back home let each one of us investigate this matter of service. Let each one determine and find out, if he can, how much his service cost him in 1921 and how much his service cost him per machine sold in 1921.

Let each one carefully go into the question of gratis repairs and replacements and determine whether his past policy has been a sane and sound one, and whether it should be continued; and each one determine how far the gratuitous service given is in excess of just demands.

Let each one determine whether in fixing his sales price he has based his manufacturing cost on manufacturing cost plus service, or his selling cost on selling cost plus service, and if not, whether he has any profits against which to deduct it from under present conditions.

Let us consider whether the furnishers of accessories and parts are performing their full duties to the manufacturer and the user, or whether they are unloading to the manufacturer their burdens under the present system. Let us consider whether the dealer, agreeing under his existing contract and for the commission received to give proper service, is doing what he has agreed to do, or is throwing the service back on the manufacturer.

Let us freely compare our views, and so arrive, not by agreement, but by reason and a comparison of views, at a sound basis on which service should be furnished.

Let us get after our various sales departments and determine whether under competitive conditions they are promising and giving unjustified free service and robbing the manufacturer of his profits, or rather increasing his losses.

The buyer is entitled to service. He cannot afford to have the machine lie idle either at seed time or harvest. The manufacturer should readily and willingly and quickly remedy his own defects, and he must provide stocks of spare parts at accessible points, but it is time for the thresher and tractor manufacturer to approximate the methods and practices of the automobile men.

THE increase of motor traffic in the Blackwall Tunnel in London has necessitated an improvement in its ventilation. Whereas in past years the occasional presence of fog in the tunnel was not associated with any real inconvenience, it was found during a recent period that the association of petrol fumes and other gases with fog made conditions in the tunnel so bad that workmen and others were overcome.

Making Salesmen Out of Automotive Factory Workers

Man is not a machine, hence the measure of his efficiency is not the ratio between energy expended and useful work done. All men in an organization should be salesmen of service. If the workmen in a plant are considered, and consider themselves, as salesmen, marketing is made easy.

DECLARING that men cannot be regarded as mere automata and that the human element is the great unknown quantity in industrial activity, Norval A. Hawkins, addressing the Society of Industrial Engineers, in session at Detroit, Friday, April 28, made a striking plea for salesmanship as a factor in scientific management.

"The work of the industrial engineer has to do with increasing efficiency," said Mr. Hawkins. "If I were to ask just what you mean by efficiency you would with one accord define it as being 'the ratio between energy expended and useful work done,' and that's where I think you're wrong!

"Applied to locomotives, engines and drill presses—yes! But to man, with his hopes, his ideals, his heart and his soul—never! Efficiency is a human problem, for without man, with his wants and his aspirations, all our machines of wealth and power fall into heaps of rust and ruin. Efficiency as an element in human progress is always measurable in the spirit and power of ideals. Human efficiency is the ratio between what I am and what I can and ought to be—between what I do and what I can and ought to do.

"Man is the 'unknown quantity' in the equation of industrial management. He, after all, is the 'XYZ' of industry because he has within himself the power of changing.

"You can't compare man with the inanimate.

"Parts made of steel, iron, brass, nickel, wood and leather can be assembled by a man into an automobile. The combination always stays an automobile until it is changed from without. The automobile cannot make itself into a typewriter or a machine gun.

Basic Difference Between Men and Machines

"Things are that way. They have no inherent capability for altering themselves in even the slightest degree. Hence, they are easily handled. Once placed anywhere, they 'stay put.' The automatic machine continues to turn out bolts; there is no possibility that it may change its mind and produce nuts instead.

"But man—how different!

"He has the power of continual and unlimited change. Told to do one thing, he may do any of fifty other things instead. He cannot be depended upon until he has been proven thoroughly, and even then he is apt to make mistakes.

"No matter how completely a man has been instructed, or how ably he is directed, his efficiency depends upon a variable factor—his initiative power for change. The man can ignore his instructions and disobey or alter his directions.

"You can pick up a slide-rule any time you want it

without giving it a smile, and it will do its little job for you quickly, unquestioningly and without a grumble. Then you can throw it down and pay no more attention to it. You need show no special interest in its performance. You do not need to help it with encouragement or advice; and when its work does not bring the result you wanted, you can show it all the temper you please. Above all, you never need to tell your slide-rule the reason why. It will work just as well for a bully or a grouch or a snob as for a real man—but men won't.

"A slide-rule will do its best for you whether it knows your purpose and is interested in your efforts or not. Men won't.

"I'm not attempting to say whether human nature is right or whether it is wrong—I am merely stating the conditions.

"As a salesman I attempt to meet these conditions as I find them.

"I think you need sales managers to help you work out some of the problems of selling the ideas of industrial engineering more effectively.

"Not only do you need sales managers but you need salesmen. Every man connected with our respective organizations should be a salesman.

We Are All Salesmen

"Since joining the General Motors Corporation I have been emphasizing to everybody with whom I have contact that they all are salesmen. Mr. Pierre duPont is our salesman president. Mr. C. S. Mott is our salesman chief of staff. Mr. C. F. Kettering is our salesman chief engineer, and so on down the line even to the porter who cleans the halls of the General Motors Building.

"I am talking salesmanship in its broadest sense—I am talking the salesmanship of service.

"Sales and service are so closely linked that the first cannot succeed without the second. I say to all our salesmen, 'You must be service men, every minute that you are selling.' And I say to our service men, 'You have an opportunity to be the very best salesmen in our entire organization.'

"The true salesman is the man who injects real human interest into his job of serving his fellow men. I believe the best salesman we have is the workman who takes pride in his task and who builds that pride into our products. The salesmen who meet the public and get the orders are not nearly so important to the success of our business as the salesmen in overalls who really love their work. As a sales manager, give me 100 per cent salesmanship in the factory, and my job in the field will be easy, for the best sales manager in the world cannot make a permanent

success of marketing a product indifferently manufactured by employees who have no pride in their work.

"When you tackle a job of industrial engineering, you should think of the workmen in the plant as your salesmen, and use sales management ideas to get them to pull with you in teamwork. Open their eyes and make them see beyond their machines, outside the factory to the customers who will use what they make. Get them interested in the people who will buy the product. It is human nature to do a better job when the man you are doing it for is standing at your elbow. You should make the workman feel the presence of the buyer right in the shop when the goods are being made. There is no better cure for inefficiency and indifference than arousing real heart interest in the work.

Workman Must See Through Salesman's Eyes

"Extend the workman's interest and broaden his perspective so that he will visualize the product in use and make him feel that his work is a part of the actual service to the user. Teach him to think of the customer as 'his boss'—the man who actually meets the payroll. Personalize the things that are being made. Inject a touch of human interest by telling the workman that he is the company's best salesman. Change his viewpoint by getting him to see things through a salesman's eyes. If you succeed in accomplishing this, the rest of your problem will be easy.

"The ordinary workman is antagonistic to industrial engineering simply because he thinks you are making him work harder and thus earn more profits for his employer. As long as the workman regards you in that light, he will oppose your efforts to improve his efficiency. You can compel him to obey, but unless he is sold on the idea, your plan will not prove permanently efficient.

"Show him the direct relation between the sales of the company and his steady job. Point out that his only competitor is a similar employee in a competing shop. Point out to him how he can help himself by helping to sell the product through the care with which he makes it. Then and then only will he be inspired by the enthusiasm of the true salesman. There isn't any employee who works so hard for his employer as the true salesman. He does not

watch the clock. He is tireless and he will fight for his concern as whole-heartedly as he would battle for himself.

"The ordinary workman is not like that. It isn't a matter of the money the two employees make. Plenty of workmen get as big pay checks as the salesmen of the house. The difference is in the viewpoint.

Teach Workmen to Say "We"

"The salesman says, 'WE,' when he refers to the company. The ordinary workman says 'They.' As industrial engineers, it is your duty to change the defiant 'They' into a co-operative 'WE.'

"Similarly you need to change the language the employer uses. He must get the habit of thinking and saying 'We' instead of 'They.' It will take a lot of sales management to get that idea across to the boss nowadays. You must train both labor and capital in salesmanship principles if your engineering job is to be of lasting benefit.

"Sales management is the answer.

"I do not suggest sales management as a substitute for industrial engineering, but as a supplemental and necessary team work. Such a combination will enable you to do your work most effectively and permanently.

"Sales management will help to broaden your outlook. Professional men are not apt to get into ruts. The salesman who succeeds is never narrow. Generally speaking, the more broad minded a salesman is the more successful he is. As industrial engineers, your efficiency and progress will be largely determined by the breadth of your vision.

"There are no problems of life involving relations between man and man that salesmanship cannot aid in solving and salesmanship is made more effective by sales management. So I emphasize your need of knowing how to sell, and the correlated need for sales management in all your work.

"Your motto then is 'Service to Industry.' Salesmanship and sales management are both dedicated to service. You and I are brothers in purpose. We should not be merely distant relatives and longer, but should cultivate a feeling of sympathy, and get together in understanding and pull together for the common good of all the world."

British Motor Truck Transport Alarms Railways

MOTOR truck transport in Great Britain has grown during the past five years to an investment of \$550,000,000 in 3000 lines, which, in 1921, carried 6,000,000 tons as auxiliary to the railways, as reported by the Department of Commerce based on statements by R. P. Skinner, United States Consul General at London, and by other agents of the department in Britain. The rate of growth of this character of transport is shown by the fact that in 1916 there were only 600 trucking lines.

Inasmuch as freight rates there are inclusive of truck haulage costs for collecting and delivering, the railway companies make an allowance of reduction from regular rates if the shipper or receiver maintains his own truck haulage system. The truck rates are based on an average of 14 cents per ton per mile for twelve miles, longer hauls yielding less per mile per ton and shorter hauls more.

Most of the truck lines are owned and operated by private companies or by individuals, although several railway companies maintain such service for haulage away from their lines. The reports say that increasing numbers of heavy shippers are establishing their own motor truck lines

even for long distances, sometimes all the way across the Isles.

"Railway companies in Great Britain," Mr. Skinner writes, "are being offered serious competition by motor highway transport, which is making great headway and is viewed with considerable alarm by railway officials.

"However, in some quarters its importance is thought to be overestimated, because motor traffic will ultimately be compelled to bear its proportion of taxes for maintenance of the highways; furthermore, doubts exist as to whether motor transport companies are setting aside proper sums for repair and renewal of vehicles."

THE possibilities of foreign trade with the Union of South Africa are well set forth in a booklet recently issued by the National Foreign Trade Council. The Union is adequately described from an industrial and agricultural point of view and the resources of the territory are set forth in an interesting manner. Although the booklet is general in character, one section is devoted to the automobile market.

Japanese Will Buy Few Cars and Trucks in 1922

Among the factors contributing to this are: numbers of unsold cars on hand at war prices and high taxes based on horse power which throws American cars in luxury class. Trucks holding their own due to low price and reputation for superiority. Import business will be light this year.

By William I. Irvine*

THE present market for automotive vehicles in Japan is poor and in all probability will continue to be so for the balance of the year. This is practically the unanimous opinion of the majority of dealers in Tokyo and other large cities, representing more than 50 per cent of the motor vehicles in use and fully 90 per cent of those imported.

The above paragraph gives the sum and substance of an automotive survey of Japan, outlining the possibilities of automobile export business in that country which has just been completed by Automotive Trade Commissioner William I. Irvine for the Automotive Division of the Department of Commerce. Several months were spent in making this survey which gives a comprehensive outlook of the passenger car and truck business which American exporters may expect in the Far East. The report goes on to say that:

"The greatest contributing factor to the poor automotive sales outlook is the business depression which Japan is now experiencing, which has not only seriously curtailed the sale of new vehicles but has caused owners of passenger cars to put their machines up. The use of passenger cars has been discontinued because of the high cost of operation. The absence of a sufficient volume of freight and the lack of demand for quick delivery does not warrant the use of trucks.

"The situation is further complicated, from an automotive viewpoint, by the large number of unsold vehicles. A careful survey among the dealers reveals that there are at least 750 passenger cars and 250 trucks unsold. Nearly all of these were purchased prior to the price reductions made during the past 12 months in the United States. Dealers tried to maintain prices for more than a year but market conditions did not warrant such action. The vehicles have remained in government warehouses in most cases in order to defer paying the duty charges ranging from 25 to 35 per cent ad valorem.

"Dealers are now cutting their prices in order to meet the demands of the banks which financed imports, and both passenger cars and trucks are being offered at prices below cost without much success. The accumulated charges from insurance, storage charges and interest, averaging about 9 per cent on capital invested in the unsold cars, results in a high selling price, about 100 per cent above American prices. With but few exceptions Japanese dealers claim to be running business at a loss or to be just breaking even. These claims seem reasonable, especially with large dealers, on account of the large overhead represented principally in the large work

shops built during the boom period for service and body building.

"A number of the more responsible dealers have raised the question of price protection. They maintain that at the present time they are holding motor cars bought at prices which to-day are higher than the present retail prices in the United States, and that the large stocks of these, even when sold at a loss, must be offered at prices higher than the price of cars of later design recently imported.

"Generally the men taking this stand are the strongest financially and consequently were in a position to finance large shipments during the boom period, with the result that they have large stocks to-day. They are now called upon to compete against smaller dealers who were not in a financial position to import in quantity, and, consequently, were not caught with many cars when the market broke and are now able to import at prices which permit them to undersell the larger dealers and make a profit. This has resulted in the sale of cars heretofore almost unknown to the detriment of the products of those manufacturers who support their equipment by financially sound dealers who are in accord with the maker's principle of service for every car sold. The smaller dealers, of course, do not maintain either service stations or repair shops, and, generally speaking, do not carry adequate supplies of spare parts. This jeopardizes the service reputation of American vehicles, which, while not perfect when considered by the standard established in the United States, is far above that of European manufacturers who, in this market at least, are not insisting that their representatives carry stocks and maintain service stations.

"Another factor operating to the disadvantage of American cars is the high tax rate in Tokyo, the center of the automotive trade in Japan. The taxes there are the highest in the world at the present time and are levied on the unsound and impractical theory of horsepower based on the cylinder bore. As American cars generally have wider cylinders than those of European make they fall in the highest tax classes. The formula used for determining the horsepower by the taxing authorities is: square the bore, multiply by the number of cylinders and divide by three. This places the cheapest American car in the same class as the highest priced European make.

"The European manufacturers have taken advantage of this opportunity to re-enter the market, and the result may be seen in the fact that the share of the United States in Japan's imports of automotive products fell from 95 per cent in number and 93 per cent in value

*Report to Automotive Division of Bureau of Foreign and Domestic Commerce.

in 1920 to 77 per cent in number and 66 per cent in value in 1921.

"Japanese dealers who represent American manufacturers have succeeded in having a reduction made in the tax rate, through continual agitation since the high taxes went into effect on April 1, 1921.

"The combination of reduced incomes and taxes created an opportunity for the importation of light cars of known economy in fuel consumption and low power rating. These vehicles, mostly imported from Europe, have been gaining in sales during the past year and present indications are that they will increase in the coming year, although dealers believe that the action of the authorities in cutting the taxes to a greater degree on higher powered cars than on those of lesser power will have a tendency to check sales.

"However, the consensus of dealers' opinions, including those handling light cars, is that the popularity of the light car will be short lived, especially among those people who have used the heavier American cars. Light cars on the bad roads of the country and unpaved streets of Tokyo subject their riders to great discomfort, while American cars, built to meet the most varied road conditions, ride easier and afford their riders a greater degree of comfort. Rear axle trouble and broken springs are common faults with the light types of motor cars.

"The Italian Fiat which sells for 7,000 yen, has been the most successful of the light cars from a viewpoint of sales. Next in popularity is the open French Renault, which sells for 7,500 yen. This is followed by the British Bean, a light car of less than 10 horsepower, the touring model of which sells for 6,000 yen. There are several other French cars, the Citroen and Mathis, which are fairly popular. In addition several freak German cars have made their appearance in the market, but they are very small and lightly built and are not deemed suitable for the conditions of the market.

"European quality cars are, on the whole, selling better than cars of similar class of American make. Sales are reported of the British Crossley, Armstrong-Siddeley, Daimler and Sunbeam cars; the Austrian Daimler; the French Renault; the Italian Lancia, and the German

Opel and Protus. The prices of the above cars range from 15,000 yen to 20,000 yen, with the exception of the German makes, which have no fixed price, but vary from 6,000 yen to 12,000 yen. These last figures on German cars cannot be relied upon because each new car has a new price, the manufacturers still being unable to set a definite selling price.

"The principal buyer of quality cars is the Imperial Household Department, which normally takes about one-third of all quality cars imported. Generally the European quality cars fall in the 15-20 horsepower class and are very economical in fuel consumption, averaging above 20 miles to a gallon of gasoline.

"The prices given above are asking prices; final prices are a matter of negotiation through the series of intermediaries who collect commissions between the buyer and seller. However, the figures will not vary more than 10 per cent.

"American trucks continue to hold the market in Japan, the best of them being cheaper than European makes. In addition they enjoy the advantage of a general belief that they are superior to European trucks. None of the latter is being sold at the present time and there is little likelihood of their getting a start this year, is the opinion of various dealers. The principal sales of American trucks are being made to the Government and municipality.

"There is no large stock of motorcycles on hand, and so far they are lightly taxed. About 75 per cent of the machines in use are of American make and it is reason-

able to assume that their position will not be seriously threatened by the European machines now being imported. American cycles are cheaper and stronger and although they are well entrenched in the public favor, sales are apt to be small but steady during the balance of the year.

"Imports of both passenger cars and trucks will be light this year because of the number of cars remaining unsold, which is about 10 per cent of all motor vehicles in the country. In all probability the market for trucks will be better than for passenger cars, as the number of former remaining unsold includes quite a few models and types unsuited to operating conditions and present understanding of automotive transportation."

HERE is the first published report sent back by Automotive Trade Commissioner William I. Irvine, who has been sent to the Far East to get practical merchandising information for automotive manufacturers. Irvine left the United States at the beginning of 1922 and has spent the last four months investigating conditions in Japan.

He makes some frank statements in this interesting article about the condition of the automotive market in Japan. He is quite specific in regard to the foreign companies which are giving American manufacturers the hardest competition in this market. He says that American passenger cars are losing ground and gives the reasons for this condition. He tells why American trucks continue to hold the market.

You will want to read carefully this brief, practical business report if you are interested in marketing your product in Japan.

More Commercial Flying in America Than Great Britain

A BRITISH contemporary makes a comparison of the amount of flying done in Great Britain and the United States the past year which is greatly to the credit of American flying. According to a White paper on the present state of flying recently issued in England on the London-Paris route, which is the only one in which Great Britain has any real share, while the arrivals and departures total 2394, the British share is only 671, which is 28 per cent of the total. The total of 17,000 flights which is given in the White Paper includes a good deal of flying which has nothing to do with air services in the

ordinary sense of that expression. A report recently issued by the Postmaster-General for one month—October last—the distance covered by the U. S. air mails on three principal routes was nearly 160,000 miles, equaling nearly 2,000,000 miles a year on mail services alone. The American statistics also show that the air services have been operated at an average cost of \$0.77 per mile, this figure including repairs and all running costs. In Great Britain people interested in air development have come to recognize the necessity of building up a productive organization for air services.

Business Books are an Aid to Executive Efficiency

Recent publications deal with automotive industry, banking, foreign trade, and personnel. "Life of George Westinghouse" is an inspiring business biography. Other new books are of practical value to the busy executive.

WHILE the average business man may not feel that he can take time to read all the latest works on industrial subjects which appear, he will find many times that new books serve as very complete sources of information for reference and will be of more value to him in that respect.

Present-day industry is so complex that one can hardly hope to master all the matter related to various divisions within an industry. One can know fundamentals and a specific line and from then on supplement information as the need appears, by using authoritative books. As to the books to be used for this purpose, the increasing complexity of the divisions of industry necessitate a constant replacement or addition of new books.

To those who have, or are establishing, a company library, information regarding new books should be welcome. The value of such a library is hard to estimate, but the fact remains that there is value. There are always some in an organization who will make use of such a library. It will encourage the rest in the reading of books which are a valuable source of information, too often unattainable elsewhere. Individual betterment will result to a greater or less degree to those who make use of this opportunity.

Much is being done in the study of labor, marketing, foreign trade and banking, and the works which appear on the subject are continually increasing to our store of information. Some of these new works are reviewed in the following pages.

We have heard from so many sources and so constantly that our business men do not go after foreign trade as scientifically as the other large industrial nations that it may have become tiresome. The fact remains that if the business of the United States is to have a large market for its surplus goods it must go after it in the manner which brings results whether it means following the methods of other countries or not. If other countries are successful then competition must be met by going them one better.

"Foreign Trade, Markets and Methods," by Clayton S. Cooper, published by D. Appleton and Company of New York, deals with the method of carrying on foreign trade and shows where the various markets exist. The volume is divided into two parts; the first deals with the principles to be followed and the necessary facts which must be known before the trade can be carried on. The second part gives a careful analysis of all the world markets and the necessary methods to be employed in each case.

The author contributes valuable information in describing the various methods of carrying on business in the different countries in order that the trader may deal with the foreign business man and consumer in the manner in which they are accustomed. Emphasis is laid on the psychology of the people of the different countries. This is contribution of a vital kind because it remains a fact

that trade between countries is the aggregate of individual connections. The success of foreign trade as a whole depends on the success of the component relations which in turn depends on a knowledge of the people with whom dealings are carried on.

Some improvements have been made in the "Engineering Index for 1921," which make it an even more convenient source of reference to use than the two previous volumes. This index, which has recently been published by the American Society of Mechanical Engineers, is composed of items selected from scientific and engineering publications received from all over the world, thus making it very complete.

To avoid confusion and lost time in seeking articles bearing on a subject, the items are arranged under main and sub-heads alphabetically, also cross-references have been worked out with great care.

"The old idea of thinking of men as so many kilograms of muscular energy to be bought, exploited, and scrapped when occasion demands, is reaping the harvest it richly deserves.

"Burst, likewise, is the bubble of paternalism which sought to determine for labor what was good for it and feed it accordingly.

"Executives are now coming to realize that their workers are not a bulky mass but a group of individuals."

It is with this idea in mind that Walter Dill Scott and M. H. S. Hayes, the authors of "Science and Common Sense in Working with Men," recently published by the Ronald Press, have written concerning the problem of dealing with men in industry.

The various mental, physical and technical ability tests are dealt with and the less easily handled problems of judging character and ascertaining desires, and other material of real practical value.

It may be said that a vast number of people do not know that George Westinghouse made safe, high speed transportation possible. Even those who do know about him cannot fail to be impressed, on reading his biography, with the great number of things that he turned his hand to with success.

The American Society of Mechanical Engineers in bringing out the lives of its noted members, has chosen "The Life of George Westinghouse" as the second of the series. Charles Scribner's Sons, New York, are the publishers.

Westinghouse carried on a great number of projects at the same time and for this reason, to avoid confusion, the biography is segregated according to topics rather than being written chronologically. This arrangement permits reading the book with the idea of determining just what part Westinghouse played in any particular enterprise or invention.

The biography should be interesting reading for engineers, but also to laymen without engineering knowledge,

for the character of the man stands out through all his varied activities. To those who are making a study of transportation, there should be a distinct appeal for a thorough knowledge of the evolution of transportation is impossible without an understanding of Westinghouse's contribution.

"To give a comprehensive exposition of the theory and practice of commercial banking in the United States" is given as the aim of the book "Banking, Principles and Practice" by R. B. Desterfield, Ph.D., Assistant Professor of Political Economy, Yale University. The book has recently been published in five volumes by the Ronald Press.

That the entire range of banking is covered is shown by the subject matter. Beginning with the elements of money, credit and banking and description of the system it passes through the internal operations and organization of domestic banking to operations of the foreign division.

This work should prove of value as a book of reference to the business man as well as to those in the banking business proper.

To those who desire information, general or detailed, regarding the New York Stock Exchange, J. Edward Meeker's "The Work of the Stock Exchange" should prove valuable. The Ronald Press Co., New York, are the publishers.

This work shows the growth of the Exchange from its early days to modern times. Beside giving the operations of the Exchange in detail, it describes its economic function in relation to the business of the Nation, and this latter should bring about a greater understanding of the Nation's financial system to the reader.

Foreign Trade

American business men have much to learn from their European brothers in the way of efficiency and many other things, in the opinion of Dwight T. Farnham, consulting industrial engineer, whose book, "America vs. Europe in Industry," has just been published by the Ronald Press.

This book, which contains many things in its opening chapters that will probably cause the American "cold-blooded business man" to laugh and say, "It's bunk," is one that is full of facts and well worth studying. For the things that Farnham sets forth are important things to the European, even if they are not to the American. As he says:

"America is now a world power and owns a mercantile marine. We must do business abroad increasingly as the years pass. To do this we must understand the foreign business man and his methods. The art of negotiation is not a game for amateurs. Provincialism must give way to finesse. We can't afford to hate foreigners because they don't understand us."

Farnham has recently completed a tour of the principal industrial plants of England, France, Germany and Italy and he gives in his book a clear picture of what is being done there. Furthermore, he shows why it is being done and he has discovered the real troubles of these European countries. Practically every phase of industrial management and operation is considered in this work, which is presented in such form as to make it interesting even to a layman. Certainly it will prove interesting and helpful to the man in industry. In the words of the publishers, it is a "graphic comparison of present European and American manufacturing methods, showing how Europe is preparing to give us a stiff fight for the world's trade."

One of the pioneers in the use of crude oil as an industrial fuel, having been engaged in the development of crude oil burners and the design of burner installations since 1887, has recently written a book under

the title of "Burning Liquid Fuel" which has been published by the U. P. C. Book Co. William Newton Best, the author, has succeeded in writing a book of a thoroughly practical character and gives examples of the application of oil-burning equipment in many industries. After an introductory chapter, the origin, production and analysis of liquid fuel are taken up, and this is followed by chapters on atomization, oil systems (means for supplying the liquid fuel to the burners), and refractory materials. From this point on the application of oil-burning equipment in different lines of industry and in transportation is taken up. Of particular interest to the automotive industry is undoubtedly the chapter on Heat-Treating Furnace Practice, which covers 23 pages and gives illustrated descriptions of numerous different types of furnace. The subject of oil-burning furnaces in iron and brass foundries is also covered.

Electric Arc Welding

Two electrical engineers, E. Wanamaker and H. R. Pennington, connected with the Chicago, Rock Island and Pacific Railroad, have written "Electric Arc Welding," published by the Simmons-Boardman Publishing Co. This book embodies their experience in the application of arc welding to railroad equipment and is confined almost entirely to a consideration of the autogenous electric arc welding process.

The material presented is systematically arranged for convenient reference. The evolution of welding processes from the ordinary hand-welding process of the blacksmith, through the electric resistance welding, thermit and acetylene welding processes to the various arc welding systems are briefly sketched. Next the equipment required in the arc process is described, and, following this, installations and accessories. The remainder of the book is devoted to such practical problems as the instruction of operators, carbon arc welding and cutting, electrode materials, preparation of work, welding of iron, steel and non-ferrous metals, railroad and structural applications.

The Automobile Repairman's Helper was originally brought out about two years ago. Since then a new edition has become necessary, and as in the meantime a great deal of new and interesting material on the subject of automobile repairs had accumulated it was found expedient to divide it between two volumes. The book was written by S. T. Williams and J. Howard Pile and published by the U. P. C. Book Co. In the second volume there are dealt with a certain number of repair jobs that are applicable to all makes of cars, and others that pertain to particular makes only. The general portion of the book covers inspection and lubrication, engine operations, cylinder, piston and crankshaft work, simple electrical testing, storage battery care and repair, pneumatic tire repairing, top work on open cars, simplified directions for welding, hand and machine tool practice, miscellaneous shop methods and systematic trouble shooting. In that portion dealing with particular makes of cars, repairs to twenty of the most popular cars and to a number of widely used components are described. The book should prove of great help to the practical repairman.

The thirty-fifth edition of "The Mechanical World Year Book 1922," an annual for the benefit of mechanical engineers, draftsmen and designers, has just been published. It contains mathematical tables and formulae and a great deal of useful data on steam engineering, gas engines, Diesel engines, power transmission and machine shop practice. The volume is of pocket size and contains about 350 pages of text with 100 illustrations. It is published by Emmott & Co., Manchester, England.

The American Automobile Holds Dominant Place in Argentine Republic

The writer believes the American car will hold its position because it more nearly meets the requirements of the country. Service has been primary factor in securing this dominant position while low price unquestionably has been important and will remain so. Last year's stocks liquidated.

"THERE is no room for difference of opinion concerning the position of the American automobile in this country. The American automobile dominates here and it will continue to hold that position."

This is the opinion of Willard T. Clark of Henry W. Peabody & Co., importers of Buick cars, Goodrich tires, etc. Mr. Clark, in an article in *Comments on Argentine Trade*, the organ of the Chamber of Commerce of the U. S. A. in the Argentine Republic, says:

"The great war undoubtedly influenced this, but only in the way of hastening to bring it about. The fact that European competition was eliminated temporarily helped to establish the American automobile in its present position, but the same result would have been accomplished, although probably not quite so soon, had there been no war. Why is this statement made so confidently? Because the American car more nearly meets the requirements of this country, due no doubt in part to the fact that conditions here are more nearly like those existing in the United States than those existing in Europe. Comparing American cars with European, we have, for instance, lighter weight for a given horse power and more road clearance. These are important features, particularly when it is borne in mind that the bulk of the automobile business is in the country where the roads are for the most part very poor.

"The flexibility of the American car in high speed, making for easy driving, has done much toward increasing the number of owner drivers."

Prestige Gained Through Service

There is one respect in which the American car has established itself, and that is in the question of service. Mr. Clark says:

"That service in connection with automobiles was never understood as it is in the United States until American cars were well introduced here. Service is uppermost in the minds of automobile buyers here to-day, and in this the American cars are far in the lead. The American agricultural machinery houses which have been established in this market for some years have undoubtedly done much toward teaching the farmer and cattle raiser the value of service. The best equipped and the best organized service stations are those run by agents of American cars, and there are service stations here which compare favorably with the best in the United States. The fact that American spare parts are made to standard and do not require much fitting and are, generally speaking, lower in price than the European, is an advantage. While on the subject, it is proper to point out that the automobile service station in this country is called upon to perform the duties of several service stations in the States. For instance, there are no agents of American speedometers, batteries or electric systems who are

prepared to give service, and the car owner would not be willing to go to them if there were. They look for service to the dealer from whom the car was purchased. In the United States, at least in the larger cities, the agents of these different accessories are obliged by the different manufacturers to maintain service stations, and the car owner is accustomed to apply to them and not to the automobile dealers for service."

American Cars Have Price Advantage

There is one other respect in which the American car should retain its position of leadership in Argentina and that is on the question of price. Mr. Clark says:

"Price is unquestionably a very important factor and an advantage which seems likely the American manufacturer will be able to maintain. American cars, light in weight, high in power, easy driving and economical, and at low prices, have within the past few years taken the automobile out of the luxury class and greatly increased its use. As the bulk of the business is not in the large cities, but in the country where the roads are generally poor, the demand is largely for the lower and medium priced car, those which are listed at present in the United States at \$1,500 and less. In some sections of the country it is practically impossible to sell any other than the lower priced cars which come in the \$600 and under class in the United States.

"The buying public here is, in the main, an intelligent one, and the disposition is to purchase the best for the purpose that the pocket will afford. It is an exacting public that appreciates quality and looks well into all details when buying a car. Especially in the matter of body work is it well informed and looks for the best, having for its standard the fine coach work which was turned out in Europe prior to the war. This is especially true concerning closed body jobs for city use. This has encouraged the building of bodies here to meet individual taste, and it is probably safe to say that there is as fine coach work done in Buenos Aires as in Europe or the United States."

Market Potentialities Underestimated

Regarding the future possibilities of the Argentine as a market, Mr. Clark says:

"It is very probably true that this market as a potential buyer of American goods has in boom times been overestimated in the minds of many of our people at home. But it is probably equally as true that the future possibilities of the country are not fully understood and are underestimated. The Argentine with a territory of almost three million square kilometers, rich in resources, has only about eight million inhabitants. It is producing to-day but a small percentage of its capacity. Development is sure to come and come rapidly with work

and the investment of capital. Those American firms who are prepared to supply these two elements, coupled with a knowledge of the country and a reasonable amount of patience, can reap a rich reward by establishing here and helping in the development of the country.

"The Argentines, who are natural lovers of sport, are enthusiastic automobilists, as witnessed by the number of races which take place every year in various parts of the country in the face of very adverse road conditions. They are very rapidly learning the commercial value of the automobile in business both in the city and country. They will be enthusiastic tourists and will use the automobile much more extensively commercially when we have better roads. At present, and excepting a few isolated places such as Cordoba, automobiling in this country is not a pleasure. But good roads, along with the development of the country, will come, and it is permissible to be hopeful that much progress will be made in the near future. The first National Good Roads Congress, under the auspices of the Touring Club Argentino, will be held in Buenos Aires on May 1 of this year, and this movement is creating a great deal of interest as well as receiving the support of commercial bodies and firms.

"Conditions are still far from normal. All of last year's cars have not been liquidated, and they are being offered at prices and on payment terms which keep the market unsettled to some extent. There has been a gratifying improvement in the exchange and a marked improvement in exports, more particularly of cereals, and the agricultural districts are for the most part in better condition than they have been. The crops in the South are poor in some parts, with total losses in others, and with rather small meat exports for many months, the cattle raising districts are in bad shape. In consequence the automobile business is good in some places and bad in others. Taken as a whole, it is much below normal, but in infinitely better condition than a year ago, and the future much less clouded.

"Opinions concerning trade conditions are influenced by personal experience, and opinions consequently will differ.

Automobile Show Sets Record

"Those distributors who have had the courage and the means to maintain their organization and keep up their efforts in spite of difficulties are breathing easier to-day and looking to the future with greater confidence than ever. Right along that line mention should be made of the Automobile Show held in Buenos Aires last October. In spite of unfavorable trade conditions, and the discouraging time the distributors were going through, the Automobile Show was the best ever held in this country and a credit to the trade."

The readjustment in the automobile industry with the importers, due to very heavy importations of automobiles purchased at peak prices during the first six months of 1921, has almost been completed. Some of the weaker importers and dealers were forced to discontinue their agencies and several went out of business. Some of the American manufacturers stood ably behind their dealers in connection with automobile commitments made during this period. Referring to this subject, Mr. Clark says:

"By far the largest percentage of these cars were consigned to the established agents here who paid for them in full, and have since liquidated most, if not all, of these old stocks, and 1922 models of some of the best known cars were in use in this country before the first of the year.

"The local distributors of some American cars were not properly organized financially or otherwise to

do the business, excepting under war conditions when it was not particularly difficult to finance business and less difficult to sell cars, and it was to be expected that these houses would be unable to carry on in face of the difficulties which beset them, and it naturally followed that these houses liquidated. Of the cars which were in this way thrown back on the hands of the American exporters and the banks there are still a few unsold. It is gratifying to note that the agencies previously held by some of these houses have since been taken up by more experienced and better organized firms who, in spite of the depression which still exists, are doing more toward firmly establishing these American cars in this market than the old agents did in good times.

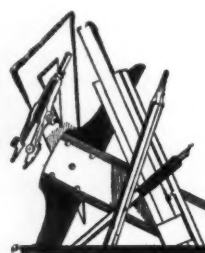
The Trade Slow to Feel Depression

"Much has been written concerning the causes of the depressed and chaotic trade conditions which were first felt toward the latter part of 1920, and to detail them here would be a needless repetition. This country itself was in excellent condition, but suffered the reflection of conditions abroad, and more particularly in Europe, which precluded the Argentine from exporting her products. Strange as it may seem, the effects which followed were not felt acutely by the automobile trade as early as they were by some other lines, and this may be responsible in some measure for the large quantity of automobiles which were imported in the face of such unfavorable conditions. All of the cars arriving here the first half of 1921, when most of the cars imported in that year did arrive, were bought at peak prices, and the great majority, if not all of them, had to be paid for at a loss in exchange which could not be recovered in the selling prices. The situation precluded advancing prices in sympathy with the rising exchange, and, generally speaking, there were no advances in automobile prices in this country after Jan. 1, 1921. In May or June of last year reductions began to take place in the States, and these were followed by further reductions later on. May it be said here to the credit of some of our American automobile manufacturers that they protected their foreign distributors upon each reduction in prices by crediting the difference in price on all cars still unsold in the distributor's hands at the time. And these same manufacturers accepted willingly the cancellation of orders, and did not increase the distributors' burdens by insisting upon their taking all the cars they had contracted for. But the reductions in prices did not offset the losses in exchange, and were consequently not reflected in a reduction in selling prices here until some months later.

Pessimism Gives Way to Brighter Outlook

"Yes, the automobile importers, along with importers of all other lines, have been going through a difficult and discouraging situation during the last eighteen months, and are not entirely out of the woods yet by any means. But to-day they look back upon the reports and prophecies of a year ago in the knowledge that they were in the main exaggerated and over-pessimistic. At that time there were large quantities of cars piled up in the custom house. But there was not a two or three years' supply, as some reports indicated; nor were all the cars left in the custom house for the account of American exporters or the banks because the importer could not, or would not, pay for them."

A MERICAN car manufacturers will play a dominant part in the Barcelona automobile show, which will be held from May 24 to June 5. Latest reports show that more than twenty American makes will be displayed.



The FORUM



The Bureau of Civil Aeronautics

Editor, AUTOMOTIVE INDUSTRIES:

With the passing of the Wadsworth-Hicks bills, in the near future, an important step in the development of the aeronautical industry will have been taken. These bills are the ones introduced in the Senate and House, respectively, to create a Bureau of Civil Aeronautics in the Department of Commerce. It appears to be generally conceded that they will eventually be passed, either in their present or in a modified form.

With the need of Government regulation of flying becoming more necessary daily, a few comments upon the scope and organization of this proposed bureau should be of general interest to the aeronautical industry. Strictly speaking, the proposed bureau has no exact parallel in other fields. Existing Government supervision of the railroads offers practically no comparison. In some ways present Government contact with the shipping industry offers comparisons. This contact, however, is divided between several departments, while in the case of aeronautics the new bureau would present a compact organization. Its very unity, in itself, promises close co-operation between the various subdivisions, to the great advantage of both the Government and the industry.

Contact with Shipping a Distant Parallel

The interest of the Federal Government in the shipping business is distributed mainly under the following departments and divisions: Department of Commerce, Bureau of Foreign and Domestic Commerce, Bureau of Navigation, Steamboat Inspection Service, Bureau of Lighthouses, Coast and Geodetic Survey, Department of Agriculture, Weather Bureau, Department of Labor, Bureau of Immigration, Navy Department, Coast Guard Life Saving Service, Hydrographic Office. Also, reporting direct to the President, the U. S. Shipping Board and the Emergency Fleet Corporation. If any parallel with aeronautics can be really said to exist, the new Bureau of Civil Aeronautics would operate the aeronautic services comparable with those rendered to shipping by the Bureau of Navigation, Steamboat Inspection Service, Bureau of Lighthouses, Coast and Geodetic Survey and the Hydrographic Office, with the probable addition of some lesser services peculiar to the aeronautical field. Several services, such as those of the Bureau of Foreign and Domestic Commerce, Weather, Immigration, etc., would function for aerial transport as for shipping.

Possible Form of Organization

Taking the activities of the proposed bureau as outlined in the bills, these may be divided into the four general heads of (1) examination, (2) regulation, (3) operation, and (4) investigation and research. Each of these four divisions calls for a certain amount of subdivision, even at the start, and further subdivision will become necessary from time to time as the work of the bureau grows in volume and variety. The accompanying diagram presents the writer's interpretation of a working organization resulting from a study of the bills. It

is suggested to the industry as a basis for discussion of the subject.

Examination

Take first the work of examination. The intimate and finely specialized knowledge necessary to handle this end of the bureau's work appears to immediately call for subdivision into the branches heavier-than-air equipment, lighter-than-air equipment, landing fields, pilots' examinations. Each calls for the services of men specialized in their particular branch. Great difficulty would be encountered in obtaining men properly qualified were an attempt made to, for example, include the examination of airships and airplanes under one head. Likewise the landing field specialists could not be expected to possess the qualifications necessary to examine pilots. As the work of the bureau expanded it would undoubtedly become necessary to further specialize the work by separating design examination from construction examination. The subdivision controlling examination of operating condition will probably also become necessary. This would permit one group of inspectors to go from field to field, making periodic inspections of equipment in service. Another group would make periodic visits to factories where equipment is under construction. The suggestion of checking manufacture may call forth some comments, but it appears important to give the inspection service some control over the actual construction. With the low factors of safety used in aircraft design, it is not practicable to depend entirely upon inspection of completed machines when passing upon their safety. Too much can be covered up during the progress of the work of construction.

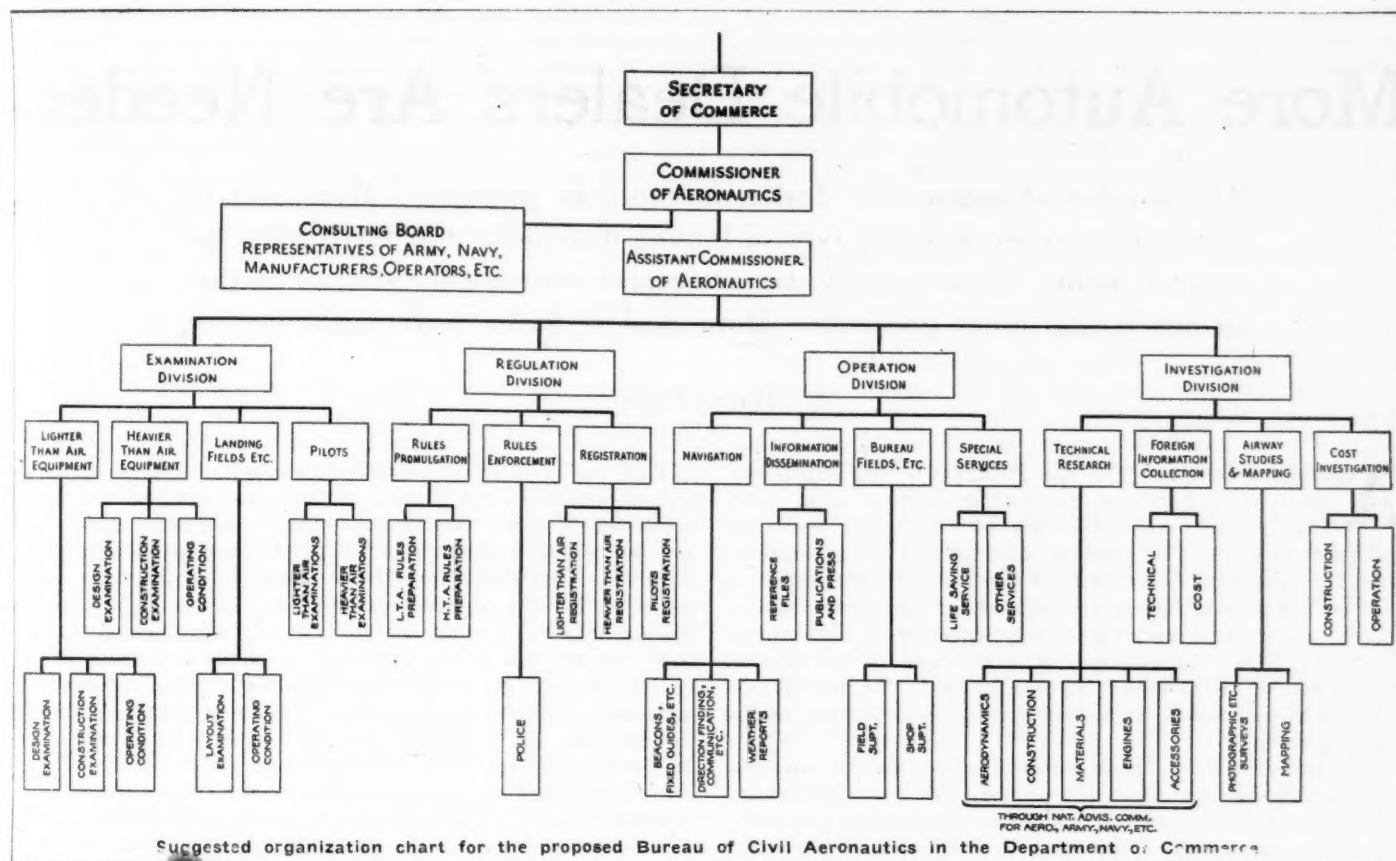
Pilots' Examinations

The question of whether or not examination of pilots should be under the same control as design, construction and operating condition examination is a debatable one. It will be influenced largely by the qualifications of the man at the head of the division. Only an experienced pilot is qualified to directly control examination of pilots. Only an engineer is qualified to direct the inspection work. If the head of the inspection division possessed both qualifications, it would be very logical to give him charge of both branches. Otherwise the examination of pilots might be placed under the regulation division in order to bring it under control of a pilot.

Regulation and Operation

The second division would bring all regulation under one head. Promulgation and enforcement of rules for navigating the air are suggested as separate subdivisions. One calls for the services of a pilot with some legal training. The other, although also calling for the services of a pilot, is practically police work. Registration is suggested as another subdivision, handling only the clerical work of keeping up-to-date records of machines and pilots licensed by other branches of the organization.

The third division would bring together under one head all operation of the bureau's equipment and appa-



ratus. Navigation is suggested as one and probably the most important subdivision, bringing together all of the services concerned directly with navigating the air. Weather reports will no doubt be handled in close cooperation with the present Weather Bureau. Any flying fields or shops operated by the Bureau of Aeronautics would be most logically placed under one head as a subdivision of operation. Special services would probably separate themselves inherently as they developed. A life-saving service for accidents suggests itself as one possible development. Information dissemination might be placed either under the operation or investigation divisions, the former being suggested, as the latter would be more of a research organization than otherwise.

Investigation

The last of the proposed divisions would control all of the work in the nature of research or investigation. I might suggest that duplication of government work would be avoided if the actual research is carried on by existing bodies such as the National Advisory Committee for Aeronautics, Bureau of Standards, Air Service, Navy, etc. The foreign information service mentioned in the bills is very desirable. It might be suggested that some of the information could be obtained through ex-

isting channels of the Bureau of Foreign and Domestic Commerce. This could be supplemented by periodic visits of aeronautical men, from the Bureau of Aeronautics, to foreign countries. Airway studies and mapping will become increasingly important as aerial transport grows and will probably call for a separate subdivision. A subdivision on cost investigation, charged with the work of obtaining data on American and foreign manufacturing and operating costs is suggested as a valuable addition. This information could be held on file for reference and furnished as required to American manufacturers and operators. A service of this kind would greatly assist in the development of the industry and of air lines and help to place both on a stable basis.

The foregoing outline of the work and organization of the proposed bureau is given as a basis for discussion. The work of this bureau would be radically different from that of any other Government body. The problems which it would have to meet are so original that some interchange of ideas on the subject, before its actual organization, should be of value to the industry. No doubt the completed bureau organization will vary greatly from the ideas suggested. At the same time this should not prevent their being worthy of discussion.

ARCHIBALD BLACK, Consulting Engineer.

The Action of Cutting Fluids

IN a paper on "Cutting Fluids," Eugene C. Bingham explains the necessity for a lubricant in machining operations as follows: It appears that whenever two clean surfaces of metal are brought together they tend to seize. Many examples prove that a quite invisible layer of impurity will prevent seizure. The clean metal of the chip moving over the face of the tool under great pressure affords a peculiarly difficult problem in lubrication. Lard oil has a much higher adhesion for metal than have the pure

mineral oils. It is drawn in between the chip and the tool and forms a strong film which prevents the chip from adhering to the tool and forming a "bead." Other oils containing fatty acids, or groups of atoms with "residual affinities," such as sperm oil, castor oil, rape oil, etc., have in large measure the advantage of lard oil. It seems readily possible to improve mineral oils as cutting fluids and as lubricants by adding liquids of high adhesion such as oleic acid, pine oil and fixed oils.

More Automobile Dealers Are Needed

The number of automobile dealers is going to increase. More will be necessary to meet changing type of buying demands. Car buying has become a habit. Consequently, buyers expect convenience similar to that in purchasing other products. More dealers mean more conveniences.

By Harry Tipper

ALL plans looking into the future for the establishment of permanent marketing policies must take into account the reactions of the buyer and his habits of buying. The methods of distribution, specialization, the character and extent of the service requirements, will be built up permanently because of the desire of the buyer rather than because of the necessity of the manufacturer. Many difficulties are in the way of the proper estimation of these effects upon the field. These difficulties are more evident in the automotive field because of its rapid growth.

The problem of distribution and service in the automotive field is different from the ordinary retailing problems. It involves a good many interests not involved in the work of other retailers. This entire distribution field, in its wholesale and retail aspects, has come within a decade and has involved many problems for which there were no precedents. Under such circumstances, it is natural that the whole field of marketing from the manufacturer to the user should be confused to some extent and present a great many conflicting tendencies.

There are no precedents within the field itself from which to measure the strength of these various tendencies, and the history of other fields is not entirely applicable, although an understanding of their development would be very useful in estimating the possibilities. To judge the problem, therefore, it is necessary to consider carefully the habits of the general buyer and the tendency to be observed in the sale of products to him in all the usual developments.

Up to the year 1920, the automobile was establishing itself as a flexible means of individual transportation. The main object and necessity was to secure its use, and the industry responded by providing a large number of units in the shortest possible time, so that this convenience could be put to work as rapidly as possible. The great object in the mind of the general buyer was to secure this means of transportation, and out of this reaction the statement has grown that every individual desires to own an automobile. The very character of the product emphasizes its usefulness. No other product in modern times has so continually emphasized its own value and its own desirability. Every automobile in motion suggests the value of ownership. Every automobile in use suggests the convenience of this means of transportation.

Economists have wondered many times at the propen-

sity of the general buyer to indulge in luxuries or to buy things which do not appear to be necessary, at the first opportunity, even when some of the apparent necessities are being overlooked. The buying of the general public, however, is governed not by the necessity of the article so much as by the relative intensity of desire for the particular article. Unless the necessity is very great, therefore, the average buyer will reserve some of his earnings for the buying of things that are not usually considered necessary because his desire to own these things is more intense than the desire for the necessities. In all sections of the population, some conveniences will be left out in order that more desirable conveniences may be secured.

Relative desire is very largely a matter of emphasis, and the emphasis is not in proportion to either the necessity or the need of service. An illustration of this difference is afforded by the rapid growth in the use of radio apparatus during the months of 1921 when many of the lines included in the so-called necessities were still halting along with a subnormal business.

We have stated that the convenience of the automobile is emphasized perhaps more than any other item in the public mind and this emphasis is reflected in the publicity

given to the automobile business and the place which it takes in conversation in ordinary circles. As the automobile grows into its regular place in the social fabric, this emphasis will be lost to some extent by familiarity, and the buying in connection with the automobile will be done more and more as the buying of other necessities. In all other lines of business dealing with necessities, the system of distribution has extended itself continually so that the convenience of buying could be more definitely established in all the separate communities. When articles become so purely a part of the routine life that they are virtually necessities, the buying is conducted more regularly and at shorter intervals because it does not receive the consideration that was formerly given to it. It is likely that the distribution system in the automotive field will extend itself so that the convenience of buying all commodities connected with the use of the automobile will keep pace with the growth and the absorption of the machine into the social fabric. As it stands to-day, the number of dealers in the automotive field, in proportion to the amount of business done, is very much less than in the hardware, the textile, and other retail lines. People were willing to go to considerable trouble in order to buy an automobile,

PEOPLE no longer buy automobiles because of novelty or pure pleasure. They buy them for the convenience obtained. This demand for greater ease in purchasing and operating calls for more dealers and better service. Mr. Tipper shows that the automobile has established itself as a flexible means of individual transportation and emphasizes the fact that the importance of the various factors influencing buying is constantly changing.

and they are willing to go to considerable inconvenience in order to secure the supplies and commodities necessary to keep it running. As a consequence, the number of retail establishments is comparatively small in proportion to the total amount of the business to be done and the widespread distribution of the automobiles themselves. The whole field has grown with such rapidity that the maximum demand upon the retail outlets has not yet been reached. As the number of cars in use grows each year, the amount of time and effort involved in keeping those cars supplied with their required equipment and service will be increased and, as a consequence, the number of retail outlets will necessarily be enlarged to meet these increased requirements.

The habit of the user in demanding convenient places in which to buy will contribute to the enlargement of the number of outlets, and to the character of those outlets. At present, the whole automotive business is in a period of readjustment not merely from the depression but from the absorption area into the stable area of development in accordance with the growth of the social fabric, in point of numbers and wealth. In other words, the past ten years have been spent in providing a sufficient number of machines to supply the needs of the population, the present period being spent in adjusting the business to the requirements of the population and, in the not very distant future, business will be shaped to the growth of the population and wealth. In this particular period, when the automobile is being adjusted to the requirements of the population, the desires of the buyer are going through some definite changes in his reaction toward his automotive buying. New elements of valuation are entering into

the purchase, and these elements arise out of a previous experience with the automobile itself—its usefulness and possibilities. These elements will be considered in detail in another article. For the moment it is sufficient to suggest their presence and their effect upon the buying habits as they react upon this industry.

The buoyancy of the automotive field in its return from a condition of extreme depression has been surprising to many business men. This buoyancy is due very largely to the emphasis which is attached to the automobile and the effect of that emphasis upon the desire of the purchaser. The readjustment of values in the buying is to be discovered in the character of the buying and the way it has flowed in response to readjustment in price or service by the manufacturer or the local retailer. The various tendencies observable in the retailing field are induced by the attempts on the part of the manufacturer and the retailer to adjust the methods of distribution to the changed attitude of the buyer.

It is the experience of industry that buyers from the general public demand a greater convenience in their buying as the product falls more and more into the routine of regular necessity and gets away from the novelty or the emphasis of occasional or new demands.

Similarly, as the product is measured by constant use, the elements of valuation in the product change and the sales approach of the manufacturer or the retailer must be altered to agree with those elements of changed valuation. The various tendencies to be observed in the retail field of the automotive business are due to the readjustment which is going on, and their value cannot be completely determined at the present time.

The Cost Accountant's Opportunity to Do Analytical Work for the Executive

THE opportunity that the cost accountant has to do analytical work and to make his position an invaluable one to the executives and the concern as a whole, is stated in the following paragraphs by Robert E. Belt, secretary of the American Malleable Castings Association, Cleveland. The nature of the work is brought out as well as the real purpose of such work, which is often forgotten.

"The work of the cost accountant, primarily, is that of ascertaining actual costs of production and distribution covering past periods, so that a reasonably accurate forecast can be made of future costs, upon which current selling prices can be safely based.

"The cost accountant, therefore, has an intimate knowledge of the manufacturing, selling and administrative departments of the business. For his advancement and success it only remains for him to make the most of his knowledge and of his opportunities.

"His work is not merely the recording of facts or the determination of costs, but in a larger and more valuable measure that of analyzing costs, of studying them to determine the whys and wherefores, of forecasting future costs and of picturing or presenting both past costs and probable future costs, so that the executive can read them and get their significance.

"Most executives have neither the time nor the inclination to analyze costs in order to determine the conditions which resulted in an unusually high or an abnormally low cost.

"This is the work of the accountant for the assistance and enlightenment of the executive and it is not the work of the executive. It is this phase of cost accounting—the

real object and purpose—in which the accountant is so often deficient.

"Unfortunately, there are many executives who manifest but little interest in cost results, and when the accountant is of the same trend of mind it is not at all surprising to find a feeling which is adverse to cost work. This latent faculty of the executive, however, is easily and quickly exercised when the accountant presents the results of his work in a manner which means something to the executive. When the executive sees that accurate and complete cost information results in the reduction of expenses or in an increase in selling prices, he is going to realize the importance of the work of the accountant and give him full credit for his initiative and endeavor.

"The ascertainment of costs means the determination of the true costs of production and distribution of the whole or any part of the product in sufficient detail to determine wherein they are exceptionally high or abnormally low, and the causes which resulted therein. The accountant, in possession of full information, is then in a position to present his facts, but bare facts should rarely if ever be presented without an explanation of circumstances and conditions which have produced the results. It is in the analysis and in the presentment of costs where the accountant can exercise the greatest initiative and can be of the most value to his employer.

"The department of the business for which the analysis is made will largely determine the nature and character of the report. Generally, an analysis and report should be made for the operating or manufacturing executives, for the sales executive, and for the general administrative executive."

AUTOMOTIVE INDUSTRIES

THE AUTOMOBILE

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How to Measure Noise

THERE has long been a rather urgent need for some method of measuring or comparing noises. About thirty years ago when trolley cars were first introduced, there was a great deal of complaint about noise from residents along the streets in which the tracks were laid, and electrical engineers gave serious thought to the problems. They believed that if they could show that a passing trolley made less noise than—for instance—a street corner Salvation Army meeting, they had a good case in court. But they failed to produce a recognized method and apparatus.

Recently controversies about noise have been frequent between automobile manufacturers and gear makers. Purchasers of cars demand silent operation. One of the operating parts most difficult to keep silent is the transmission gear, owing to the high pitch line velocity of some of its gears. Of course, no method of measuring noise can render gears any more quiet, but if there were some dependable and recognized method

of determining the amount of noise emitted it would help avoiding disputes.

By means of a permanent magnet, coil and diaphragm the energy of sound waves can be converted into electric energy, which can be readily measured. One difficulty here seems to be that so much depends upon the relative location of the diaphragm and the source of noise, but the same thing applies in case the noise falls upon the human ear. The amount of noise from a particular apparatus falling upon the ear often varies considerably with the position of the listener. It might be necessary, as in the case of measuring the light emitted from an unsymmetrical source, to determine the mean spherical intensity.

That the problem is a difficult one will be readily admitted, for if it were not it would long since have been solved in a satisfactory way. We understand that research work along this line is contemplated by a Western institution if the necessary funds can be raised.

Used Car Valuation

IN a recent survey by the National Automobile Chamber of Commerce, one of the plans definitely favored by dealers and manufacturers was that the latter in advertising new cars should also advertise the market price of older models, based on cars in good condition.

It was claimed that the advantages in publishing used car values would be that:

First: The car owner would not expect an overallowance in trade.

Second: The dealer would not give an overallowance unknowingly.

Granted that these reasons are correct as far as they go, there are also some disadvantages which should be considered and as far as possible removed.

The fact of giving only one valuation figure will in many cases cause a sales resistance, for it is a common weakness for an owner to think that his particular car is in good condition whether facts warrant it or not. It will tend to make all allowances gravitate toward that one figure.

There are three possible valuation figures:

First: That determined on cars in good condition.

Second: Valuation set on cars in poor condition.

Third: An average valuation.

The first will tend to make wornout cars bring more than their legitimate value. The second will work an injustice to the man who takes care of his car. The third and last will tend to permit unlimited overallowances which defeats the very ends to be striven for. To do away with these disadvantages public announcements of used car market prices might give maximum and minimum figures for each model based on valuation of cars in good and poor condition respectively.

Much of the difficulty experienced in used car allowances is due to an owner's preconceived notion as to a car's actual resale value. If any plan is adopted great care should be taken to prevent this so that an owner will have an open, unbiased mind at the time of the car's appraisal.

Can Airship Builders Walk Before They Creep?

FOR many months the Navy Department has been engaged in the design and construction of a giant airship known as the ZR-1. This ship is understood to resemble in many ways the ZR-2, which, it will be recalled, crashed during test flights in England, with the loss of many lives, less than a year ago. It has recently been announced that Rear-Admiral Wm. A. Moffett, Chief of the Naval Bureau of Aeronautics, has requested the National Advisory Committee for Aeronautics to appoint a special committee of engineers to make a complete and detailed study of the plans and specifications for the ZR-1, with a view, it is understood, to securing a check upon the stresses involved. While the Navy is said to be confident that its own plans for the airship are correct, it desires the opinion of an independent committee in order to avoid the possibility of future adverse criticism. This is a wise and open-minded procedure on the part of Admiral Moffett, especially in view of the recent catastrophies with lighter-than-air craft and the fact that many misgivings as to the likelihood of a similar occurrence when the ZR-1 takes the air are being expressed by many well-wishers for the future of aeronautics.

In the absence of specific information regarding the design and type of construction to be employed in the new ship, it is too soon to draw conclusions as to the correctness, from an engineering standpoint, of plans already completed and being followed in manufacture of parts. It may not be amiss, however, to ask some rather pointed questions which might well be made the subject of another investigation as to the wisdom of continuing with the construction of so large a ship at such great expense as is involved, even though the investigation now requested shows that the design is based upon proper stress calculations and appears to be "safe," so far as present engineering knowledge of the subject goes.

The British, at one time enthusiastic over the possibilities of the rigid type of lighter-than-air craft, are reported to have entirely abandoned their civil and military program of development along this line and to have offered for sale all ships of this type. What reason is there for doubting that a similar course would not be expedient upon the part of our own Government?

The Germans, who have admittedly obtained the greatest degree of success in the construction and operation of airships of the rigid type, are reported to have declared that construction of the largest Zeppelins was justified only as a war measure—that the experience in the construction of smaller ships did not warrant going to such large designs and that such designs would not have been thought of in time of peace. Yet the ZR-1 is understood to be as large or larger than any other airship ever built. Is there sufficient justification for such a prodigious undertaking?

The successful operation of lighter-than-air craft is generally conceded to depend upon careful training and experience, which is usually gained first in handling small ships. How is such experience and training to be gained by Navy personnel when the Navy possesses no small, lighter-than-air ships of the rigid type? Would it not be more practicable to start with a much smaller ship, or even a number of them, modeled, if need be, after some of the highly successful Zeppelins, and thus build up an experienced personnel which could expect to handle a larger ship with minimum chance of disaster?

In short, does it not involve unnecessary risk to attempt building an "Old Ironsides" before a successful smaller ship of similar type has been constructed and flown?

In asking these questions, AUTOMOTIVE INDUSTRIES has at heart nothing but the best wishes for the Navy and for aeronautics, which we confidently hope will develop sanely and as rapidly as a healthy growth will permit. Another disaster such as that which occurred to the ZR-2 in England and the Roma at Hampton Roads may do irreparable damage. Huge sums have already been spent upon the ZR-1, but these may well be sacrificed rather than face the result of a possible disaster which might for many years completely check progress in one important field of aeronautics.

Production Figures Convince Skeptics

Prove Industry Practically at
Capacity—Plants Seek
Larger Output.

By JAMES DALTON

NEW YORK, May 9—Skeptics who have thought reports of the tremendous business being done by the automotive industry were exaggerations have been routed by the preliminary production figures for April, which show that approximately 213,000 cars and trucks were turned out in that month. When the final figures are compiled they are quite likely to shatter the record of 220,000 established in March, 1920. The biggest month in 1921 was August, with 180,781.

Not only was April one of the two biggest months in the history of the industry, but production for the first quarter was the largest on record for the first three months of any year except 1920. It marked a gain of more than 100 per cent over the same period last year.

May is certain to be as large as April, and factories in the Detroit district will exert themselves to produce even more heavily. Capacity output will be necessary to fill orders now on hand and those which still are running into the plants in a flood which shows no sign of abating.

Good Outlook for June

June also promises well, although it does not seem possible that business can continue into the third quarter at the present levels. It is probable there will be the usual mid-summer decline in sales, but nothing like a slump. In fact, it now seems certain that production for the first half of the year will be so heavy that the total for 1922 will be materially larger than for 1921, even if there is a sharp falling off in the sales in the last half, which now seems unlikely.

While expansion of truck sales has not been as sensational as in the passenger car field, the market is expanding month by month, and the output for the year will be much larger than in 1921. There has been a steady gain each month this year, and the percentage of increase over the same period last year has been large. The output for April was almost as large as for the entire first quarter. It is significant of the improvement in the farm market that half the commercial vehicles turned out in the first three months of the

Business in Brief

NEW YORK, May 9—Continued gains have been made in the past week by business and industry generally. Retail trade has improved slightly, crop conditions are somewhat better, the commodity markets are still stronger and industry has taken another long stride forward. The coal strike has failed as yet to exercise a serious adverse influence on the situation.

Car loadings are increasing, except in the case of coal. Railroad earnings showed another increase in March.

Railroads, at the end of April, had placed orders for 59,023 freight cars, or double the total for all of 1921.

Unemployment is steadily decreasing in the West as well as in the East. Building operations are delayed by inability to get enough workmen, and the same is true of skilled factory operatives in some lines, especially automotive.

Grain traffic in the Northwest is picking up rapidly. Wheat prices have made slight gains and the outlook for the new crop is very favorable.

Large mail order houses in the Chicago territory find May starting better than April and expect a larger month because farmer buying is steadily increasing.

Operations in the metal mining districts continue uninterrupted, despite the coal strike.

Bank clearings for the week ending May 4 were \$7,690,931,000, a gain of 20.2 per cent over the corresponding week of 1921.

Money continues easy, the security markets are in trading position and foreign exchange is somewhat irregular with sterling stronger.

Since last September the securities of American holders have advanced in value by 33 1/3 per cent, adding \$5,000,000,000 to the purchasing power of the security holders, but the advance in stock averages has come to a halt, for the present at least.

year were made by three companies producing popular light trucks fitted for farm use.

Parts plants have speeded up production to such an extent that the shortage in some lines, which slowed up operations last month in a considerable number of factories assembling vehicles, will be considerably alleviated in May.

Akron reports a boom in tire sales commensurate with that in the passenger car and truck field. Reserve stocks are being depleted to meet demands and production has been expanded.

Body Shortage Still Is Serious Factor

Situation Is Aggravated by Labor
Unrest—Parts Coming
Through Faster

By D. M. McDONALD

DETROIT, May 6—The body situation continues to be the most serious factor in the general production program of automobile factories in the Detroit district. Though the situation is apparently eased, it is only because it is too early in the month to begin straining for certain production figures. Many factories are still somewhat fagged from the April effort.

Aggravating the body situation is a condition of labor unrest which is largely due to the shortage of skilled body help and which has resulted already in a strike in the finishing department of one of the leading body makers of the city. With prices of cars at existing low marks, there is a little possibility of increases in wages. If wages go up, car prices are certain to follow.

Try to Meet Labor Problem

Manufacturers who have been intending to locate their own body plants in the Detroit district will probably find it necessary to bring in entirely new corps of skilled workers. Every effort is being made to develop workers from the present unskilled ranks, and many men are being brought in from other cities, but there is need still, under existing rush conditions, for hundreds of men.

Manufacturers of cars using custom made bodies have been unable to get bodies in anything like the quantity required. Lincoln has been sadly handicapped in this respect, a condition which is almost certain to result in the establishment by that company of a body plant which will be ample for all its requirements. Cadillac, making its own bodies, has had no difficulty, nor has Packard, which practically controls the output of its two body makers.

The demand for closed body cars is a distinctive feature of the 1922 buying. There is undoubtedly a definite desire on the part of the car owning public, especially that part which is not buying for the first time and which can afford to own only one car, to have that one car a closed vehicle. Price reduction and the development of the coach type vehicle have brought the closed car within the price range of many owners for the first time this year, and this is regarded as largely responsible for the increased business.

Closed Car Demand Varies

Demand for the closed car varies largely according to the line. In some factories it is running higher than 50 per cent of production and in others it is much lower. It is noteworthy, however, that those factories which have striven to develop distinctiveness in their closed

(Continued on page 1037)

New G. M. Car Moves Toward Production

**"Copper Cooled" Automobile
Will Be Turned Over to
Chevrolet for Manufacture**

NEW YORK, May 9—The General Motors Corp., which is now doing an exceedingly gratifying business in all its passenger car lines, expects sales for the third quarter of 1922 will exceed those of the second quarter. This belief is based on careful investigations and analyses which have been made. These reports point to a very large demand during the mid-summer months for Cadillacs, Buicks and Chevrolets, its three leading passenger car lines.

Not only is the domestic business of General Motors Corp. running at a high level, but there has been a very gratifying increase in export demand. The schedules of the London branch have been materially increased in the past week.

The new copper cooled car, which has been developed by C. F. Kettering in the research laboratories at Dayton and which has been subjected to a long series of the most severe tests, will be turned over in a short time to the Chevrolet Motor Co. for practical experiments along manufacturing lines. Manufacture of experimental models will be under the direction of W. S. Knudsen, and such practical modifications as are necessary will be made.

Thorough tests will be made of the models turned out by the Chevrolet company, and it is expected that manufacture of the new line in small quantities will begin early in September. At the beginning only 15 or 20 a day of the copper cooled line will be turned out. It is expected that the new line will sell for about \$150 more than the Chevrolet "490."

It can be stated positively that the new copper cooled line, which is purely experimental up to this time, will have no effect whatever on the "490" line, which will be continued as heretofore.

De Berg Succeeds Parker as Kelly Truck Director

SPRINGFIELD, OHIO, May 8—Stockholders of the Kelly-Springfield Motor Truck Co. at their annual meeting Monday re-elected all of the old directors with one exception. Walter De Berg, assistant cashier of Emerson McMillin & Co., New York City, was elected in place of H. S. Parker. The report submitted shows that the company's business is steadily increasing and that prospects are bright for the future. The directors elected were: James L. Geddes, E. O. McDonnell, E. S. Kelly, J. E. Bowman, Paul C. Martin, Grayson Lathrop, B. J. Westcott and P. H. Diehl of Springfield; Charles Willard Young, A. P. Lathrop, Marion McMillin, C. N. Jellisse, James

Little Reason for Existence of Used Car Problem with Dealers Throughout Country

By H. M. Jewett,

President of the Paige-Detroit Motor Car Co. and Jewett Motors

Detroit, May 8.

FROM an automobile manufacturer's point of view, there should be no more a used car problem than a new car problem. We never hear of dealers coming to us asking how to sell their new cars. Why should there be any question as to how to sell the used cars?

The same principles of merchandising that are involved in selling the new cars apply to selling the others. When there is a market for the new cars there is a market for the used cars, and inversely, when there is no market for the new ones there is no market for the old ones. Dealers should be quick to size up market conditions and know when to shut down on taking in the old cars.

So far as my study of the automobile business has gone, I have been impressed with the fact that there will always be a market for its products, new cars and used alike. In the West there are quite a number of companies which make a business of junking automobiles and they are making money. Cars which have outlived their usefulness go off the market in the form of junk. When more junk-yards are necessary to handle used cars we will have them. That phase of the business will be taken care of.

Dealers should exercise good judgment in taking in cars in exchange for new ones. Where the price allowance is right the sale of the old one should be as ready as the new one. If a stock of used cars is accumulated dealers must cut down on accepting trade-ins.

Our experience with the new Jewett car shows that there are hundreds of sales which can be made by dealers without accepting trade-ins. In introducing the new car we instructed our dealers to look for buyers who had no cars and this policy has proved very effective. Some cars are being taken in, but only that the dealer may sell them for the buyer. On our Jewett business the trade-in allowance will be discountenanced for a considerable time to come.

Business throughout the year should continue on a very even keel. Farmers are coming into the market now in the West and the Central West, and their buying is having its effect not only on our business, but on all business. Farm-product markets are improving all the time as are markets for fruits and lumber. The lumber producers are now far behind on orders. Credits which in some districts have been frozen for eighteen months or more are again liquid.

Taking everything into consideration, there is no reason why the automotive industry should not enjoy a record year. April was the largest month our factory has ever known and May will exceed it.

Lawrence and Walter De Berg of New York City; A. G. Hare of Philadelphia.

The directors organized re-elected these officers: Chairman of the board, James L. Geddes; president, Charles Willard Young; vice-president and general manager, E. O. McDonnell; vice-president, James McCarthy of Quebec, Ont.; vice-president, A. P. Lathrop; vice-president, Marion McMillin; vice-president, James Lawrence; secretary and treasurer, P. H. Diehl.

TO DISCUSS TRAFFIC MATTERS

NEW YORK, May 9—Means of solving some of the truck traffic problems, such as overloading and overspeeding, will be considered at a conference late this month of the motor vehicle commissioners of all the New England States, New York, New Jersey, Pennsylvania and Maryland with a special committee of the National Automobile Chamber of Commerce composed of R. H. Salmons of the Selden Motor Truck Co., R. O. Patton of the Pierce-Arrow Motor Car Co., D. C. Fenner of Mack Trucks, Inc., F. W. Fenn, secretary of the motor truck committee, and Harry Meixell, secretary of the motor vehicle conference committee.

Paul duPont Identified Actively with Daniels

NEW YORK, May 9—Announcement is made by Gillespie, Meeds & Co., who are forming a syndicate to underwrite the sale of \$1,000,000 of 8 per cent preferred stock of the Daniels Motor Co. of Reading, Pa., that Paul duPont of Wilmington, Del., president of duPont Motors, Inc., and his associates have become actively identified with the Daniels company. It is stated that duPont has taken a substantial financial interest in the company.

There have been reports recently that George E. Daniels had decided to resign as president of the company, but he emphatically denies that there is any truth in the statement, which he characterizes as "ridiculous."

At the annual meeting of the directors the following officers were elected to serve for the ensuing year: George E. Daniels, president; N. E. Parish, vice-president and chairman of the board; L. L. Gillespie and H. W. Mansfield, vice-presidents; W. L. Davis, secretary and treasurer; J. K. Rhinelander, assistant secretary, and R. A. Wetherhold, assistant treasurer.

Must Ask for Space at Paris by May 24

No Requests to Exhibit at Show Will Be Received After That Date

PARIS, April 28 (*By Mail*)—Requests for space in the Paris automobile show, to be held in the Grand Palais from October 4 to 14, inclusive, will not be received later than May 24. The French show is closed to ex-enemy nations. Allied manufacturers are placed on an equality with French firms with the exception of American makers, who are only admitted after other requirements have been met.

One of the new rules stipulates that traders and body builders will not be allowed to exhibit chassis or complete cars by manufacturers who do not have their own stand in the makers' section. This will cause several firms, among them Rolls-Royce and Ford, to come into the show as car manufacturers, contrary to their general practice, or will shut them out altogether. Firms in the hands of an official receiver will not be allowed to exhibit, thus bringing the Paris practice in line with that of London in this respect. A special section has been formed for automobiles of less than 61 cubic inch piston displacement, the organizing committee having recognized the growing importance of this class of popular automobile.

Space Prices Same as in Past

Henri Cezanne, who continues in the capacity of show manager, announces that the Paris exhibition will be organized on economical commercial lines. The system of refunds to exhibitors will be maintained. For the last show about 50 per cent of the stand rentals was returned to exhibitors. Gate admission will be increased from 3 to 5 francs on ordinary days, and from 10 to 15 francs on the opening day and Fridays. Stand rentals remain unchanged so far as the ground floor is concerned. Beginning at 500 francs a square metre, the price drops to 120 francs a metre. Exhibitors at Paris have to sign a guarantee not to take part in any exhibition, fair or race unless it is approved by the National Automobile Federation. The Paris show will be the first of the European series.

Bethlehem Reorganized with Murray Board Head

NEW YORK, May 8—The Bethlehem Motors Corp., which recently was purchased at receiver's sale by A. T. Murray and Howard B. Hall, former officers, has been reorganized by the election of Murray as chairman of the board; Hall as president; E. H. Leland as vice-president and treasurer; W. H. Rogers, secretary and assistant treasurer.

A statement issued after the reorganization declared "there are no other interests either directly or indirectly asso-

ciated with Mr. Hall," except Murray and the First National Bank of Boston. This would seem to dispose of reports that Martin L. Kern, who organized the original Bethlehem Motors Corp., was interested in the purchase of the assets.

The board of directors is composed of the officers and Clifton H. Dwinell of Boston, Richard Bennett, Jr., and Peter J. Brennan of New York. It is stated that the company intends to enter the truck manufacturing field in a substantial way as soon as possible.

Indiana Section of S. A. E. Holds Its Annual Meeting

INDIANAPOLIS, May 9—Following the May meeting of the Society of Automotive Engineers council here yesterday, the Indiana section last evening held its annual meeting, election of officers and dinner with council members as guests.

The new officers of the section are as follows: O. C. Berry, Wheeler-Schebler Carburetor Co., chairman; Ion R. Smith, Midwest engine Co., vice-chairman; B. F. Kelly, Weideley Motors Co., secretary; Mark A. Smith, Midwest Engine Co., treasurer.

In short talks, council members told of the summer meeting and gave brief reviews of the council work and progress of the society. Council members present at the meeting and dinner included B. B. Bachman, president; O. W. Young, David Beecroft, C. F. Clarkson, H. M. Crane and F. J. Scott.

The Indiana section will send a large delegation to White Sulphur with Mark A. Smith as the delegate and W. Guy Wall as alternate.

Cleveland Suggests Meals for A. A. A. Presidency

CLEVELAND, May 8—Cleveland this year is putting forth a candidate for president of the American Automobile Association in Judge Walter D. Meals, president of the Cleveland Automobile Club and former president of the Ohio State Automobile Association, and for many years an active worker in the interests of better highways and better laws for the encouragement of motoring. Former presidents of the A. A. A. have all come from east of the Alleghenies.

Judge Meals's name will be formerly presented to the association at the annual meeting in St. Louis, May 19-20. Judge Meals is judge of the Court of Claims of the United States Shipping Board at Washington.

Meeting Dates Changed

WASHINGTON, May 8—The annual meeting of the board of directors of the American Automobile Association will be held at St. Louis Friday and Saturday, May 19 and 20, instead of May 22 and 23, as previously announced. The change of date is made necessary by the fact that the American Medical Association has reserved the entire hotel accommodations of St. Louis for the week of May 22.

Order Cancellation Halts Walker Plan

Refinancing of Company Had Been Provided with Over- writing of \$390,000

CLEVELAND, May 9—The plan that had been worked out for the refinancing of the H. J. Walker Co., manufacturer of automobile engines, has been abandoned for the present, according to a statement made by one of the heads of the financing syndicate.

The refinancing called for the raising of \$300,000 of additional capital for the company. E. J. Kulas of Crouse, Tremain & Kulas, investment bankers of this city, which handled the matter for the syndicate of automobile men and bankers, had obtained subscriptions for \$690,000, or an overwriting of \$390,000.

Creditors holding a majority of the claims had subscribed to their part of the financing plan, which was that they should take preferred stock in the corporation.

A part of the proposal called for a certain showing of orders for engines, and one of the big automobile companies had been lined up for a substantial order of the company's motors, but it was learned the order has been cancelled. This represented approximately 50 per cent of the new orders that had been relied upon.

Merger Discussed

Lately there have been conferences on the part of business men, bankers and capitalists for the purpose of discussing the plan of bringing under one management for credit purposes several well-known corporations in this city that are engaged in the automotive business.

The Grant Motor Co., the Parish & Bingham Co., the H. J. Walker Co., and the Standard Equipment Co., have figured in this talk. Men holding stock in all four companies and others holding claims against them have figured in the negotiations.

Work on this transaction has been suspended for the time being, although there is talk of it being revived.

Germany Will Have Show and Also "Grand Prix"

BERLIN, April 25 (*By Mail*)—The German automobile show will be held in Berlin at the Kaiserdamm hall from Sept. 25 to Oct. 3, under the auspices of the German Automobile Manufacturers Association.

A race, "The Grand Prix of Germany," will be held Sept. 24 on the Avus track between Berlin and Grunewald by the show management in association with the Automobile Club von Deutschland. The race is open to foreign cars, 2 litre models of 650 kilograms minimum weight and 3 litre cars of 800 kilograms minimum weight being eligible. The race is 25 laps, which is equal to about 500 kilometers.

Miniger Likely Buyer of Auto-Lite, May 29

**Court Fixes \$4,700,000 As Upset
Price—Sale Will Include
Three Plants**

TOLEDO, May 9—A court order signed by Judge John M. Killits in Federal court here has set the sale of the Electric Auto-Lite division of the Willys Corp. for May 29, at 11 o'clock, at the county court house in Toledo.

Frank P. Kennison and Francis G. Caffey, receivers for the Willys Corp., have been appointed special masters to make the sale.

The upset price stipulated in the advertisement of sale is \$4,700,000. It is understood here that C. O. Miniger, at the present time operating head of the Electric Auto-Lite and one of the receivers, will be probably the only bidder for the plant.

The sale includes the two plants in Toledo and one at Fostoria. Included in the assets also are 100 shares of stock in the Burt Foundry Co., Toledo, and 1000 shares, the total stock, of Electric Auto-Lite Corp., a Delaware sales unit.

The \$89,556.40 claim for state taxes in Ohio now in litigation will be taken care of out of proceeds of the sale by the receivers, should any judgment be granted to the state. Federal taxes accruing during the receivership shall be paid by the purchaser of the property.

Provision is also made whereby the Willys-Overland Co. shall release the Willys Corp. for claims arising out of a contract for furnishing of farm lighting equipment.

The sale is to be made as of Feb. 28, 1922. The special masters are granted the power to postpone the sale without notice.

Industry Represented on U. S. Chamber Ballot

NEW YORK, May 9—Two representatives of the automotive industry have been nominated for directors of the Chamber of Commerce of the United States. They are W. O. Rutherford, vice-president of the B. F. Goodrich Co., who is a candidate from the domestic distribution group, and C. F. Kettering, president of the General Motors Research Corp., who was nominated to represent the sixth district composed of Ohio, Indiana, Illinois, Michigan and Wisconsin. The directors will be elected by the National Councillors who will meet in the Washington Hotel at Washington, Monday, May 15. Persons in the automotive industry have been asked to request the councillors who will represent their local Chamber of Commerce or Board of Trade to vote for Rutherford and Kettering.

An effort is being made to insure a large attendance of councillors at the highway transport section meeting of the

Chamber of Commerce, which will be held Tuesday afternoon, May 16, in the new Masonic Temple at Thirteenth Street and New York Avenue. The speakers will be T. H. MacDonald, chief of the Bureau of Public Roads, and E. J. Mehren, editor of the *Engineering News Record*. A. J. Brosseau, who represents the National Automobile Chamber of Commerce on the directorate of the National Chamber, will preside at this meeting.

Peugeot Goes 95.5 Miles On One Gallon of Gasoline

PARIS, May 1 (by mail)—A distance of 123.2 miles was covered by a 45 cubic inch two-seater Peugeot light car on a can of gasoline containing 1.29 gallons. This is equivalent to 95½ miles per American gallon. The performance was made in open competition at Le Mans over ordinary roads, each of the competitors being given a can of gasoline and the winner being the one covering the greatest distance.

The winning Peugeot, driven by Gre-millon, was followed by Henry Petit on a similar Peugeot who covered a distance of 115 miles before coming to a stop. The third car home, also a Peugeot, was driven by Madame Lavie, and covered 95 miles. The first three cars were fitted with Zenith carbureters.

Durant Output Estimated at 14,000 This Quarter

NEW YORK, May 9—Durant Motors, Inc., hopes to improve in the second quarter the remarkable showing it made in the first three months of the year, when it ranked eighth among the automobile producers of the country, including Ford. With production being expanded as rapidly as possible, Durant hopes to pass one of its competitors by the close of the first half year.

Production of the Durant line for the second quarter is conservatively estimated at 14,000. The output at Long Island City will be at least 6000, at Lansing 5000, at Toronto 1500, and at Muncie 1500. This does not include 1000 of the new Stars, which will be turned out in June at Long Island City and Lansing. One hundred samples of the Star line will be made this month.

The sales policy for the Star has not been worked out in detail, but it is expected to include some rather unusual ideas when it is announced. It is understood to be the plan of the company to sell the cars to its distributors at cost and take a certain proportion of the profit.

SALES MADE AT ELECTRIC SHOW

NEWARK, N. J., May 9—An electric automobile show held here had 23 exhibitors and resulted in the direct sale of considerable equipment and an added interest in electric automobiles. The Public Service Electric Co. provided exhibition space and assisted in staging the show.

Viggo V. Torbensen Forms Axle Company

**Formerly Head of Corporation
Bearing His Name—Plant
in Cleveland**

CLEVELAND, May 8—Viggo V. Torbensen has formed the Vig Tor Axle Co. for the manufacture in Cleveland of passenger and commercial car axles. For a number of years Torbensen served as president of the Torbensen Axle Co. and has been active in the industry for the last twenty-six years. The axle the new company will make has been designed by Torbensen.

A group of men well known in the axle industry have become associated with Torbensen. A. L. Kroesen, who will be vice-president and general manager, was for a number of years connected with the Detroit-Timken Axle Co. of Detroit. Kroesen came to this city to become director of production for the Eaton Axle Co.

W. N. Jackson, treasurer of the new company, has been associated with Torbensen for several years. Carl R. Harrison, secretary, is vice-president of the City and Suburban Realty Co. of this city. B. A. Fleming, assistant secretary, is a graduate of the University of Kansas Engineering School and has been making a study of production methods in the axle business for some years. Directors are Torbensen, Jackson, Harrison, and Joseph Lyons, president of the Lyons Machine Co. of this city.

Shipments from Canada Totalled 14,724 in Year

OTTAWA, ONT., May 8—The exports of Canadian motor vehicles for the fiscal year ending March 31, 1922, numbered 14,724, valued at \$8,032,804, while automobile parts were valued at \$1,151,453.

This compares with a total of 15,620 passenger cars, valued at \$11,376,278, and 4286 motor trucks, valued at \$2,499,103, shipped during the twelve months from March 31, 1920, to March 31, 1921. The value of the parts shipments during the same period were \$4,262,325.

KILLS BILL INCREASING TAXES

BOSTON, May 6—Motor organizations in Massachusetts fighting legislation here won a sweeping victory when the lower branch of the legislature killed the proposed one cent a gallon tax on gasoline and 100 per cent increase on truck fees.

BIG SUM SPENT FOR GASOLINE

HARTFORD, CONN., May 8—In the past six months Connecticut motorists spent \$7,500,000 for gasoline, according to the department of motor vehicles, and inasmuch as the state tax is one cent a gallon the officials are sure of the figures.

Indiana Plants Need Skilled Workmen

**Companies Are Seeking to Build
Up Factory Forces—Schedules
Increased**

INDIANAPOLIS, May 9—Nordyke & Marmon Co.'s recent price reduction has brought increased business to the factory in the past few days. Shipments of approximately 500 cars are expected to be made this month, this being more than for any month of 1921 with the exception of June, 1921, just subsequent to the large cut announced then.

The plant is now employing 2650 men and additions to the force are being made steadily. Not more than 600 of this force are said to be engaged in the manufacture of milling machinery, although this force as well as that of the automobile division is to be increased.

Other local and near-by Indiana factories are using the classified columns of local newspapers in the endeavor to build up working forces. The Maxwell plant of Newcastle as well as Studebaker of South Bend are advertising for skilled workmen in local papers daily. While there is no shortage of local labor, it is far from as plentiful as it was two months ago. The drain from state manufacturers and from those of Michigan and Ohio, started about a month ago, has greatly decreased the surplus of skilled automotive labor that existed here until very recently.

Stutz Motor Car Co. is also increasing its factory force, and finding it increasingly difficult to pick up skilled workmen. The business at the plant has steadily increased during the last forty days, and by May 15 an enlarged production schedule is going into effect. Retail sales and orders from the country at large have gained.

H. C. S. Motor Car Co. has also added to its force somewhat and has a larger output than at this time last month. Sales and orders are gaining and meeting the expectations of factory officials.

Scarcity Felt in Toledo

TOLEDO, May 9—Automotive plants made a large gain in employment during the month of April, according to statistics secured for the United States Department of Labor here.

The Electric Auto-Lite Corp. put on 300 more employees; the Willys-Overland Co. added about 400, and the Toledo Chevrolet plant placed 100 more men at work.

Other allied plants made small additions to their forces, while several of the malleable castings plants greatly increased production due to orders from automobile manufacturers.

Delay in getting steel and other materials and shortage in the supply of skilled labor is retarding production in several of the large plants.

The Willys-Overland Co. reports sales holding up at the high level established

SEES MOTOR VEHICLE AS RAIL AUXILIARY

NEW YORK, May 8—The relationship between the motor vehicle and the railroads is beginning to define itself with a fair degree of clearness, in the opinion of Elisha Lee, vice-president of the Pennsylvania Railway System.

In an address before the Transportation Club, Lee asserted that the motor vehicle is destined to play an important part in short distance transportation service, both for passenger and freight. He believes the time may come when the motor car, motor bus and motor truck will be looked upon not so much as competitors of the railroads but as helpful auxiliaries. He does not think, however, that motor vehicles ever will compete seriously with the railroads for long haul business.

Lee does not see any immediate commercial possibilities for the airplane as a carrier.

in March. Recently a whole trainload of 25 cars was shipped from here to Charlotte, N. C., billed to the Dail-Overland Co. The shipment was disposed of to dealers in less than 24 hours after its arrival.

Group Meetings Replace G. M. Truck Convention

PONTIAC, MICH., May 9—A series of meetings of branch and agency managers and salesmen for the General Motors Truck Co. was instituted here May 4 and 5, when 22 men attended a sales gathering at the plant. They came from Chicago, St. Louis, Indianapolis, Pittsburgh and Detroit agencies and spent the time in the study of manufacturing processes as they relate to sales, the discussion of mutual problems in truck selling and to hearing lectures from the general sales force and executives of the company.

The meeting marks the substitution of the group conference for the convention idea in the plant's program. It will be the first of a series to be held at intervals of about two weeks until the entire country has been covered.

Consensus of reports from the salesmen and managers here was that business is greatly improved in their territories.

INTERNATIONAL REPAYS LOAN

WASHINGTON, May 8—The War Finance Corp. announces that the International Harvester Co. has repaid the advance of \$4,000,000 made to the company in the spring of 1920 to finance the exportation of agricultural machinery and implements. The loan was not due until 1923.

White Co. Reports Big Gain in April

**Improvement Was 50 Per Cent
Over Year Ago—Plant Out-
put Increasing**

CLEVELAND, May 9—Business of the White Co. increased 50 per cent in April of this year over the corresponding month last year.

During last month the company received 987 orders, as compared to 640 in the same month of 1921. The announcement of the figures was made by Walter C. White, president, at the annual meeting of the corporation.

During the month just closed the company delivered 855 trucks, or 20 per cent more than were delivered in April of 1921. Factory production is increasing and since April 750 additional men have been employed. This brings the number on the factory pay roll to more than 3000.

The company would, at the present rate of business, sell approximately 9000 trucks in the present year, upon which substantial earnings would be made.

White reported that the cash position of the company continues to improve. The notes payable amount to \$2,800,000 and no customers' notes have been discounted. There is cash of \$2,500,000 and accounts of notes receivable of \$6,000,000.

The following directors were re-elected: Windsor T. White, Walter C. White, Thomas H. White, Homer H. Johnson, Otto Miller, Warren S. Hayden, J. R. Nutt and William G. Mather of Cleveland; Walter C. Teagle and E. R. Tinker, of New York City, and Philemon Dickinson of Philadelphia. R. W. Woodruff, of this city, was elected to fill the vacancy caused by the death of A. R. Warner.

These officers were re-elected: Windsor T. White, chairman; Walter C. White, president; Thomas H. White, vice-president; George H. Kelley, treasurer, and T. R. Dahl, secretary.

DOBLE LOCATES FACTORY

SAN FRANCISCO, May 9—Doble Steam Motors is now located in a factory at 714 Harrison Street, where production on Doble steam cars will start Aug. 1. Production for 1922 will not exceed 30 cars, and 1923 production will be on the basis of 300. Abner Doble, long a figure in the steam field, is president, and W. A. Doble, Jr., general manager.

RUBBER ASSOCIATION TO MOVE

NEW YORK, May 8—The Rubber Association of America has leased the Broadway frontage on the 10th story of the Fisk building at 57th Street, this city. The space measures 2000 feet, including a large conference room where the association directors will meet. The Rubber Association has been located in recent years at 52 Vanderbilt Avenue.

Federal Tests Seek Better Tire Mileage

Carcass Holds Key to Sustained Power, Bureau of Standards Finds

WASHINGTON, May 5—Tests to enable the automobilist to get better and more mileage out of his tires are now being made by the Bureau of Standards, it was announced to-day when the bureau gave its first preliminary report on the work already done.

The proper design and the correct inflation pressure of tires are of major importance if the motorist is to get the greatest mileage, the report states. Tests made show that various parts of the tire contribute to the absorption of power, of varying degrees. From 80 to 85 per cent of the loss in power, it was found, is due to the carcass of the tire, 10 to 15 per cent to the tread, and about 5 per cent to the tube.

These results are based upon tests which were made on a special type dynamometer in the rubber laboratory of the bureau. The dynamometer consists essentially of a motor for driving a standard automobile wheel and tire, a pulley which bears against the latter, and a generator driven by the pulley. By suitable weighing arrangements the difference between power input and output may be easily measured. The difference represents the loss in the tire.

It is possible to test upon this machine any make of tire under varying conditions of speed, inflation pressure, etc. The present announcement of the tests, it was stated, is only a preliminary statement. A brochure is now being prepared and will be ready for the automotive industry in six or eight weeks.

Expansion of Factory Begun by Studebaker

SOUTH BEND, IND., May 8—The Studebaker Corp. already has begun the expansion of its plant for which the directors have authorized the expenditure of \$3,000,000. The new structures will include a closed body building plant and car storage and shipping buildings. They will permit an increase in the production of light sixes from 200 to 300 a day. The building program, which has been mapped out will require the eventual expenditure of \$15,000,000 and will cover five years.

The first of the buildings to be erected will be the storage plant, paralleling the administration building. One of these will be 624 x 76 feet, four stories high, built of reinforced concrete. The other will be a one-story structure, 624 x 77 feet.

The closed body plants, which will be built upon the present site of the old harness factory of the original Studebaker enterprise, will be four stories high. One of them will be 145 x 170 feet and the other 370 x 145 feet. These buildings will be completed by October if pos-

12 TOPICS SELECTED FOR SERVICE MEET

NEW YORK, May 9—Twelve discussion topics have been tentatively selected for the N. A. C. C. factory service managers' convention at Detroit on May 16 and 17. The topics are:

Progress of the flat rate system.
Parts and labor practice in connection with warranty.

Parts adjustments.
Interchange of gratis service among dealers.

The retail end of the service problem.

Methods of educating the dealer.
Ideal co-operation between car sales and service departments.

Servicing cars in outlying districts.

Practicability of 24-hour service.
Pirate parts.

Advantages of a fixed service policy.

Reasonable guarantee limit as to time and mileage.

Edward S. Jordan and O. E. Hunt will address the convention. The headquarters will be at the Hotel Statler.

sible and will be ready for operation not later than Jan. 1. The company also will build a large new power plant. It is expected that 2500 more men will be added to the payroll by Jan. 1.

Body Shortage Still Is a Serious Factor

(Continued from page 1032)

vehicles are the ones that are getting this business. The increase in the closed car business has had a somewhat retarding effect on the compilation of new production records because of the greater care required in the building.

Overtime work continues unabated in most of the parts and equipment plants, and deliveries of materials have reached a volume in keeping with the production requirements of the makers. Foundries, by employment of constant shifts, have brought the castings situation well within bounds, and deliveries are now coming through on most of the small parts and fittings which for a time threatened hold-ups.

HOWARD J. DIETZ DIES

NEW YORK, May 8—The death is announced of Howard J. Dietz, son of the late Robert E. Dietz, founder of the R. E. Dietz Manufacturing Co., which manufactured the first lamps for automobiles. He was 55 years old, and his death was caused by heart disease. Dietz was active in the aviation and automobile fields. He was the first man in Hempstead, Long Island, to own an automobile and was the inventor of an airplane which bore his name.

Lang Body Co. Gets New Lincoln Order

First Award Since Ford Became Identified With Car Company

CLEVELAND, May 9—The most striking increase in factory pay rolls since the first of the year has come about in the automobile and automobile parts and accessories factories of the city, according to the statement of the Labor Relations Committee of the Chamber of Commerce.

The number of employees in the automobile factories surveyed has increased 79 per cent in the last four months.

For the first time this year the report shows that the number of employees in the 100 corporations, including automobile factories and those in other industries, is greater than it was at any time in the year 1920.

In the automobile industry the number of employees in the factories surveyed, and there are eighteen of them, was 9972 persons on April 29 as compared to 5568 last December and to 10,310, the largest number in the year 1921.

For the first time in many months the Lang Body Co. is operating at practically capacity. Orders have been received in increased numbers each month since the first of the year.

A contract has been obtained by this company to build closed body types for the Lincoln Motor Car Co. The firm has been making Peerless closed bodies for some months and will get into production as soon as possible on the Lincoln contract. Shipments are to start Sept. 1. The new order will run indefinitely. The Lang company built bodies for the Lelands, but this is the first order obtained since Henry Ford became identified with the Lincoln organization.

Standard Parts on Upgrade

The Standard Parts Co. has found business on the upgrade, and orders have been coming in at an excellent rate. There has been talk in the financial circles lately that the time is not far distant when the receiver will be able to turn the property back to the stockholders for management.

COPP CORP. FORMED

NEW YORK, May 8—The merger is announced of the George W. Copp Co., Inc., the Copp Body Co. and the New York Auto Equipment Co., Inc., as the Copp Corp. with a plant in Long Island City. The consolidation provides advantages in the manufacture and distribution of the slide sedan top, taxicab bodies, closed bodies and tops made by the corporation. The company now is in a position to deliver, for example, an order up to 50 taxicab bodies mounted and painted, within one week. A fully equipped reconditioning and repair department also has been established.

Demand for Trucks Is Large in Mexico

Mining Companies Are Making Purchases for Transporting Ores and Supplies

MONTEREY, MEXICO, April 20—(By Mail)—Although Mexico imported automobiles and motor trucks to the value of \$15,000,000 United States money in 1921 there promises to be more than \$20,000,000 of these vehicles sold here during the present year. Some dealers estimate that the sales may run as high as \$25,000,000.

The demand for motor trucks is spreading all over the country, it is stated. Many of the larger mining companies are buying trucks for the transportation of ores and supplies. The jump of the automobile and motor truck trade from approximately \$2,000,000 for the year 1920 to \$15,000,000 for 1921 was due to the improvement of industrial and business conditions generally, it is explained.

In 1915, Mexico imported from the United States 70 automobiles to a value of \$66,830. In 1920, Mexico imported 4089 automobiles to a value of \$3,525,210, while the truck importations increased from \$14,492 in 1919 to \$1,973,994 in 1920.

In view of the almost virgin field for profitable motor vehicle trade in Mexico the matter of establishing a plant here for the manufacture of automobiles and motor trucks has been under consideration recently by American interests. It is pointed out that all of the raw materials, such as iron, rubber, fibers and woods, are to be had here in abundance, while labor is cheap.

Fleet Ordered

MEXICO CITY, April 20—(By Mail)—The American Smelting & Refining Co. has received permission to establish a fleet of thirty-seven motor trucks and to construct roads for the operation of this fleet between its mines and the town of Santa Rosita, in the State of Coahuila, according to announcement by the Department of Commerce, Industry and Labor here.

French to Make Engine with Burt Single Sleeve

INDIANAPOLIS, May 6—According to the American representatives of Wallace Glasgow, Limited, agents for the Burt single sleeve engine, the Societe des Moteurs Gnome et Rhone, Paris, has taken out a license to build 20-hp. passenger car engines. This will probably be of the four cylinder type.

This announcement of the French aviation concern to manufacture automobile engines operating on the Burt or Argyl single sleeve cycle has caused considerable comment among automobile engineers on the continent and in this country. It is known that a number of large

concerns in this country have been quietly investigating this engine for some months. A significant feature of the announcement is that it is possible that air-cooling may be used successfully with the Argyl or Burt sleeve action. A number of Burt air-cooled farm lighting systems with air-cooled cylinders are in operation in England at the present time.

New Buick Sport Phaeton, Model 55, Priced at \$1785

DETROIT, May 9—Buick is now putting out a sport phaeton on the six-cylinder chassis. This will be Model 55 and is in addition to the 6-54 special roadster which will be continued. The car is specially equipped throughout with a four-passenger body of practically five-passenger size.

The equipment includes an adjustable sunshade attached to the windshield, rear vision mirror, threshold plates of aluminum, runningboard step plates of nickel trimmed rubber, khaki top, combination clock and speedometer, cigar lighter, carpets in front and rear compartments, and walnut steering wheel. Tuarc steel wheels are optional equipment at \$50 additional if installed at the factory. The car is provided with a touring trunk and double tire carrier. The price is \$1,785 f.o.b. Flint.

SHULER MAKES BUS AXLES

LOUISVILLE, KY., May 10—The Shuler Axle Co., Inc., has started production on a line of front axles intended exclusively for motor buses. The company for several years has been making front axles for trucks, trailers and tractors, and these will be continued. The new design is strong and heavy, and the spring pad is 7 in. lower than usual. There is a large factor of safety and the journal surfaces are quite large. Material specifications and essentials of design are identical with the regular line.

SCHWARTZ OLD LINE REPLACED

READING, PA., May 8—The Schwartz Motor Truck Corp. has designed a new line of trucks to supersede the models previously made. The capacities and prices follow:—1-ton, \$1,685; 2-ton, \$3,000; 3-ton, \$3,600, and 5-ton, \$4,900. The prices have not been changed on the 1 and 5-ton models, but the 1½ and 2½-ton models have been discontinued.

SAYS AVALON IS BANKRUPT

AKRON, May 6—Harry L. Snyder, Akron referee in bankruptcy, has recommended to Judge C. D. Westenhaver of the United States District Court at Cleveland that the Avalon Rubber Co. be adjudicated in bankruptcy and that trustees be appointed. Since last November affairs of the company have been in the hands of Ray Hamlin as receiver. J. F. Hower of Akron is president of the company, which has been in production for two years. Snyder reports assets of \$25,000 with total liabilities of \$35,000.

New Lines of Tires Bring Lower Prices

Will Reduce Cords Below Market Lists of Regular Stand- ard Makes

AKRON, May 8—Tire prices, instead of taking their expected and long rumored increase the first of May, have come down. Prices on regular standard make tires have not been reduced, but action tantamount to reductions has been taken by several companies in introducing entirely new lines of cords to sell at from 20 to 25 per cent below the present standard cord tire market lists.

In addition the new Seiberling company at Barberton has made a revision downward of prices on Seiberling cords and Portage fabric tires, bringing both down to the standard market levels. Heretofore they had sold at above the standard list prices.

Goodyear Tire Ready in June

Goodyear is one of the first to announce a new line of lower priced cord tires. The new Goodyear Cross-Rib cords, ready for delivery in June, will sell at about 25 per cent below the present standard cord tire prices and below the prices of Goodyear All-Weather tread cords. Goodyear officials say the new tires are not being developed to compete with standard cord makes, but to compete with jobbers now giving long discounts on standard tires. The new tire will not be a two-cure process casing, but a one-cure instead. It will, however, according to Goodyear, give as many miles per dollar as higher priced cords.

The American Tire & Rubber Co. has introduced a similar tire to sell on the same price lists as the new Goodyear cross-rib cords. This new American-Akron cord will be put into the field in direct competition with all other tire companies marketing a cheaper line of cord casings.

Seiberling's Adjustments

Seiberling's price adjustments bring the cost of the 32 x 4 cords down from \$32.90 to \$32.40; the 34 x 4½ from \$44.50 to \$43.90; and the 35 x 5 from \$55.40 to \$54.75. On the Seiberling line of Portage fabric tires, the price reductions are from \$10.90 to \$9.50 on the 30 x 3 clincher; \$12 to \$10.50 on the 30 x 3½ clincher; \$25.45 to \$22.90 on the 32 x 4 straightside; and from \$27.25 to \$24.60 on the 34 x 4 straightside.

The Mohawk Rubber Co., whose tires have been selling above the standard lists, announces a new Little Chief fabric tire to sell at the standard market prices.

SANFORD ADDS A TRUCK

SYRACUSE, May 9—The Sanford Motor Truck Co. has added a new 1½-ton truck to its line. This will sell for \$2,150, which is the chassis price. The engine has a bore of 3¼ in. and stroke of 5 in., and the tires are 36 x 3½ front, 36 x 5 rear.

Shortage of Parts Hampered Overland

Prevented Maximum Output— President Willys Optimistic at Annual Meeting

TOLEDO, May 10—Gratifying reports of the outlook for the Willys-Overland Co. were made to the stockholders at their annual meeting here yesterday by President John N. Willys. He said the delay in obtaining materials in sufficiently large quantities was all that prevented maximum production and that the company is oversold on several thousand orders.

Dealers all over the country are clamoring for cars, and the company is allotting them only portions of their orders, Willys said. The officers of the company believe that supplies of material will be large enough to permit maximum production in July. April was one of the biggest months in the history of the company, with sales and orders far in excess of the output. More Overland and Willys-Knight cars were sold at retail the first week in May than in any previous week, with one exception, Willys declared.

No reports of earnings for the first quarter were submitted, but it was stated that such a report would be made later to cover operations for the first six months.

Two new directors were elected. Frank G. Allen of Moline, Ill., will take the place of J. R. Harbeck of New York, and C. M. Keys was added to the board. Allen will represent the Moline Plow Co. on the board. Keys is at the head of the Curtiss Aeroplane & Motor Corp.

Stephens Salient Six Prices Again Lowered

MOLINE, ILL., May 8—Following the refinancing and reorganization of the Moline Plow Co., announcement is made by the Stephens Motor Works of another price reduction on its various models. The prices follow:

	Old Price	New Price
Roadster	\$1,675	\$1,575
4-passenger Phaeton..	1,745	1,595
6-passenger Phaeton..	1,745	1,625
Coupe	2,650	2,450
Sedan	2,650	2,550

In addition to the price concessions a considerable number of refinements have been added to the different models.

KING REDUCES PRICES

DETROIT, May 8—The King Motor Car Co. has made price cuts ranging from \$330 to \$725. The prices follow:

	Old Price	New Price
Roadster	\$2,140	\$1,795
Phaeton	2,125	1,795
Coupe	3,125	2,400
Sedan	3,235	2,550

KISSEL LOWERS LISTS

HARTFORD, WIS., May 5—Reduced prices are announced by the Kissel Motor

Car Co. The list follows:

	Old Price	New Price
2, 4 and 7-passenger		
Phaeton	\$2,675	\$2,385
Coupe	3,125	2,975
Sedan	3,235	3,075

The company has brought out a new 5 passenger phaeton, which sells at \$1,885 as compared with \$2,675 for the old model.

HOLMES PRICES DROP

CANTON, OHIO, May 5—The Holmes Automobile Co. has reduced the prices of its various models. The list follows:

	Old Price	New Price
7-passenger Phaeton..	\$2,950	\$2,500
4-passenger Phaeton..	2,950	2,500
4-passenger Coupe....	3,850	3,300
7-passenger Sedan....	4,150	3,600

HAYNES ROADSTER REDUCED

KOKOMO, IND., May 9—The Haynes Automobile Co. has reduced the price of its model "75" two-passenger roadster from \$2,595 to \$2,395.

NEW JUMBO LISTS

SAGINAW, MICH., May 9—The Nelson Motor Truck Co. has reduced the prices on its entire line of Jumbo trucks. The list follows:

	Old Price	New Price
Jumbo 15.....	\$2,425	\$2,295
Jumbo 20.....	2,675	2,520
Jumbo 25.....	3,090	2,660
Jumbo 30.....	3,590	3,060
Jumbo 35.....	4,080	3,900
Jumbo 40.....	4,730	4,400

LAUSON TRACTOR LOWER

NEW HOLSTEIN, WIS., May 9—The John W. Lawson Mfg. Co. announces the following reductions in price on three of its models:

	Old Price	New Price
Lauson 15-25.....	\$1,685	\$1,495
Lauson 15-30.....	1,985	1,875
Lauson Road, 15-30....	2,225	2,100

Murphy in Duesenberg Sets New World Record

SANTA ROSA, CAL., May 8—Jimmy Murphy in a Duesenberg Special won the 100-mile Cotati speedway event there yesterday in what is unofficially stated to be the world's record, two minutes under the former mark, when he came home ahead of a fast field in 52 min. 10.23 sec. Frank Elliott in a Leach Special was second and Harry Hartz in a Duesenberg third.

The 50-mile heat was won by Pietro Bordino in a Fiat Special in 26 min. 13.36 sec., with Hartz second and Murphy third.

DELCO SALES ENGINEER DIES

DAYTON, OHIO, May 5—Frank W. Edwards, sales engineer of the Dayton Engineering Laboratories Co., died at his residence here from an acute case of pneumonia. Edwards was well known in the automotive field. He had been associated with the Delco company for more than a decade, and in that time had made many friends in the industry.

No Indications Seen of Decline in Sales

Much of Retail Business on Time Basis—Truck Trade Improving Rapidly

NEW YORK, May 10—Directors of the National Automobile Chamber of Commerce at their meeting in Detroit last week were unable to detect any signs of a slowing-up in the flood of orders for motor vehicles. Dealers in all sections of the country, except in a few agricultural districts, report that there were no indications of a falling off in sales. There has been a great improvement in the used car market, and dealers now are trading cautiously, turning their stocks over quickly. The truck business is improving very rapidly. Sales of heavy duty vehicles are best in Chicago, where a large number are being used in building operations.

One extraordinary feature of the present sales situation is that from 35 per cent to as high as 80 per cent of the retail business is on a time basis. This is construed to indicate that by no means all of the sales now being made are the result of increased purchasing power resulting from high security prices.

Good Future for Utility Car

It was the opinion of many of the manufacturers that the utility top car, or low priced closed car, will have a very heavy sale after July 1 and that this will tend to keep the plants making models of this character running at capacity.

The directors decided to appoint a committee which will be headed by Roy D. Chapin to confer at Washington, May 24, with representatives of the Bureau of Roads and the National Association of State Highway Officials in reference to a general road program. While the subjects to be considered have not been worked out in detail, one of those taken up will be the financing of highways. The decision of the automotive industry is that all property and all residents along improved roads benefit from them, and for that reason motor vehicles should not be taxed for their construction. It is admitted, however, that inasmuch as motor vehicles are the chief users of the highways the taxes imposed upon them should pay the maintenance costs.

NATIONAL CONSIDERS MERGER

INDIANAPOLIS, May 11—The National Motor Car & Vehicle Corp. has sent a financial statement and letter to stockholders announcing that the company has been invited to become a part of the Associated Motor Industries. A decision on the question will be reached at the annual meeting of the corporation in New York. Stockholders at that time will accept or reject a substitute proposal to sell all the corporation's properties and assets. The banking interests are said to favor the consolidation.

Men of the Industry and What They Are Doing

Newmark Now With Durant

J. H. (Jake) Newmark, who was advertising manager of the Chevrolet Motor Co. for several years prior to his transfer to Detroit where he has been attached to the advisory staff of the General Motors Corp., has resigned to become associated with the sales department of Durant Motors, Inc. He will be in charge of advertising for the New York, Lansing and Toronto plants under the direction of M. B. Leahy, general sales manager. Newmark will join the Durant organization this month and his headquarters will be at Long Island City. Newmark is considered an expert on sales, and Leahy believes his services will be highly valuable in building up the Durant organization. Before going with Chevrolet, Newmark was with the Apperson Bros. Automobile Co.

Tegder Directs Hanson Sales

J. C. Tegder has been appointed director of sales and advertising of the Hanson Motor Co., Atlanta. He has been an automobile distributor for a number of years, and in 1910 served as sales manager of the Staver factory in Chicago.

Herwig Sales Manager for Ogren

R. S. Wiltrout has been made treasurer and general manager of the Ogren Motor Car Co. through changes in the organization, and C. A. Herwig has been appointed vice-president and sales manager.

Flum is C. G. Factory Manager

R. A. Flum of Cleveland has been appointed general factory manager of the C. G. Spring Co., Kalamazoo. He held a similar position years ago with the Perfection Spring Co. of Cleveland, and goes to Kalamazoo to be associated again with his old chief, Christian Girl.

Perrine Leaves Auto Parts

W. E. Perrine has resigned as president of the American Auto Parts Co., and J. C. Parsons has been appointed acting president.

Long Again Heads Wheel Makers

Hargrave A. Long has again become general manager of the recently reorganized Wood Wheel Manufacturers Association with headquarters in Chicago. Long became manager of the industrial group department of the Motor and Accessory Manufacturers Association when the Wood Wheel Manufacturers were taken in as a group, but retired when the M. A. M. A. decided to abandon its group activities.

Hutz with Fedders in Canada

H. L. Heitzman, secretary of Fedders Manufacturing Co. of Buffalo, has com-

pleted a tour and survey of Canada which has resulted in the locating of a branch factory at Bridgeport, Ont., for the production of Fedders radiators and parts. This plant will also be equipped to do a limited amount of sheet metal work in connection with radiator parts.

L. C. Hutz, for several years purchasing agent for the Pierce-Arrow Motor Car Co., has become sales manager of the Canadian plant for the Fedders company.

Coleman Manages Mitchell Branch

T. L. Coleman has taken over the management of wholesale business of the New York Mitchell Motor Co., New York City. His association with this company comes after many years experience in the industry. Among other engagements, Coleman was general sales manager for the Chevrolet Co. of Canada, controlling the entire Dominion, in charge of sales, service and manufacturing; general sales manager also for the Packard Motor Co. of Pittsburgh and district manager for Hare's Motors, traveling through the East and South.

L. H. Bennett Joins Jobbers

L. H. Bennett, formerly a Ford dealer, later with Studebaker and General Motors and more recently a merchandising worker for the Pacific Coast group of Automotive Equipment Jobbers, has joined the Chanslor & Lyon Co. of San Francisco as merchandising director. This is a new office which will bring Bennett in close contact with dealers, enabling him to assist them in analyzing their interests and problems.

Sheets Joins Lomar

W. M. Sheets, formerly of the Miami Cycle Works, has been made sales manager of the Lomar Manufacturing Co., Middletown, Ohio. Sheets has been identified with the motorcycle and bicycle business for a number of years, and through this work has built up a wide acquaintance from coast to coast.

Singer Is Advance Sales Manager

Walter O. Singer has been appointed general sales manager of the Advance Rubber Co., Brooklyn. Until receiving this appointment Singer served as district manager for the Globe Rubber Tire Manufacturing Co. of Trenton, in charge of a good portion of the Eastern territory and the New York branch.

Meixell Investigates Tire Bill

Harry Meixell, secretary of the Motor Vehicle Conference Committee, has gone to Atlanta at the request of the Rubber Association of America to investigate a tire branding bill which will be introduced in the Georgia Legislature at the coming session.

Hawkins Criticizes Present Advertising

Marred by Exaggerated Statements, He Says—Transport Idea Should Be First

DETROIT, May 10—Exaggerated emphasis has been placed on quality of product in automotive advertising, in the opinion of Norval A. Hawkins of the advisory staff of the General Motors Corp. In an address before the Michigan Automotive Trade Association here to-day he vigorously criticized the present trend of most automotive advertising and declared that it either confuses or disgusts the public.

The prospect knows, Hawkins said, that all the vehicles advertised cannot be the best, so the almost unanimous claims of superiority have little effect. He blamed superficial thinking about distribution for the conditions existing.

Effective advertising of the future, he declared, will talk about motor travel and transportation as desirable and leave in the background or to the inference of the reader the fact that with a certain product it can be accomplished comfortably and economically. He states further:

Only Facts Should Be Set Forth

The advertisement should state nothing about the product but indisputable facts, such as price, wheelbase, equipment, etc. There should be no extravagant statements of quality of product and the product should be mentioned only as incidental to motor travel and transport. This idea of motor travel and transport never has been sold, with the product completely subordinated. The product always has been pushed to the front with some claim of peculiar excellence.

In my opinion the advertising of the future will be dominated by the organization which first establishes and which maintains the unique standard of ideas of motor travel and transport to the fore and facts of quality implied, but seldom stated, far to the rear.

Hawkins quoted anonymously from a collection of more than 200 of what he termed catch phrases culled from the advertisements of forty-six manufacturers, showing that while wording was different the thought expressed was similar in all cases. He declared that such advertising at most sells only familiarity with a name.

Doody with Earl Motors

W. A. Doody, for the last three years connected with the Jackson Steel Products Co. of Jackson, has been appointed district sales supervisor for Earl Motors, Inc., with permanent headquarters at Rochester. Previous to his association with the Jackson company, Doody was a member of the firm of Ryan & Doody, dealing in stocks and bonds in Rochester.

Plants Speeding Up in All Branches of the Industry

Releases on Engine Contracts

INDIANAPOLIS, May 9—Midwest Engine Co. views the releases that are being placed on contracts for its products by customers as one of the noteworthy indications that business is now reaching its real pace. These releases have made it difficult, for the time being at least, for production to keep up with deliveries, although production is now swinging closer to delivery promises. In the last ten days the company has closed additional contracts with three truck and one tractor manufacturers for their 1922 requirements.

Big Gain in Quarter by Maxwell

DETROIT, May 6—Production of the Maxwell Motor Corp. for the first quarter of 1922 was 340 per cent more than for the first quarter of last year, according to a statement by President William Robert Wilson. During April demand for Maxwells so far exceeded increased production that the factory is six weeks behind on orders for May delivery. About 2500 men have been added to the payroll since the first of the year. Many departments are working day and night and much new machinery has been added to stimulate production.

Oakland Best Since September, 1920

PONTIAC, MICH., May 9—Sales made by the Oakland Motor Car Co. during the month of April were greater than for any month since September, 1920, according to George H. Hannum, general manager of the company. Hannum declared business was holding up during the first few days of May at the same or a higher level, but that production for the present would be kept on an even plane. The plant is turning out about 100 cars daily, a pace struck several weeks ago. No difficulty is now being experienced in getting materials, Hannum said.

Michigan Firms Expand

PONTIAC, MICH., May 9—Both the Bradt Wheel Co. and the Rochester Metal Products Co. of Rochester, Mich., near this city, have experienced an increase of business in the past two months that has necessitated increased operating space. They occupy a building owned by the village and the town council has ordered the expansion to meet their needs. The Bradt company makes metal disk wheels and the Rochester Metal company, machine screws, for automotive plants.

Yellow Cab Adding to Plant

CHICAGO, May 8—The Yellow Cab Manufacturing Co., manufacturers of Yellow taxicabs, this week began the construction of an additional story to its two-story office building adjoining its factory, and within the next two weeks

it is planned to start work on a factory addition. It has not yet been decided whether the factory addition will be one or two units.

The growth of the company's sales in the last few months makes expansion necessary. Officials state that orders now in hand provide for capacity operation into the month of August. The output is now sixteen cabs a day and an effort is being made to increase this to twenty-five. The sales force is being increased, five road salesmen having been added recently. It is planned to divide the United States into ten sales districts.

G. M. Truck to Increase Output

PONTIAC, MICH., May 8—The General Motors Truck Co. will increase its production just as soon as material difficulties are straightened out, according to W. L. Day, general manager. Day declared that increase of business as reflected in orders coming to the plant had been considerable during the past few weeks and warrants an increase of production. Delay in getting materials has recently been holding up the plant somewhat.

April Biggest Month with Nash

KENOSHA, May 10—Nash Motors Co. reports that April was the biggest month in its history, 18 per cent more cars being shipped than in April, 1921. Even the previous record month, August, 1920, was eclipsed in point of shipments. The first quarter of 1922 shows an increase of nearly 52 per cent over the similar period a year ago, according to C. B. Voorhis, vice-president and director of sales.

Night and Day Shift at Wills

MARYSVILLE, MICH., May 8—An addition of nearly 33 1/3 per cent to the working force was made this week by C. H. Wills & Co. in their Wills Sainte Claire plant here. A full night shift and a full day shift are now working. Every effort is being made to double April production.

R. & V. Shipments Good in April

EAST MOLINE, ILL., May 9—Shipments of the R. & V. Motor Co. in the last month exceeded those of any other month in a long period, according to officials of the company. An executive officer just returned from an Eastern tour says the trade outlook is promising and conditions show every sign of improvement.

Ships 10,000 Magnetos Monthly

SPRINGFIELD, MASS., May 8—During the past five months the American Bosch Magneto Corp. has shipped 82,000 sets of starting and lighting systems. Shipments are now running at the rate of 10,000 a month.

Republic Rubber on Two Shifts

YOUNGSTOWN, May 9—Republic Rubber Corp. has increased truck tire operations from a one-shift to a two-shift basis, and in the inner tube department from two to three shifts. Under the new schedule the company is producing 20,000 tubes and 10,000 casings weekly. Officials estimate April gross sales approximated \$525,000, compared with \$470,000 in March. Further gains in volume are expected in May. The increased output is going directly to dealers and consumers, and the company is accumulating no finished inventory.

Hendee Making 1800 Monthly

SPRINGFIELD, MASS., May 8—The Hendee Manufacturing Co. will maintain its present rate of production through May, which will mean an output for the month of 1800 motorcycles. It is stated that the new credit system, enabling the dealer to make instalment payments after the custom introduced by automobile companies, is proving of value in stimulating selling. The export trade in motorcycles is reported as improved, among the latest foreign orders being one for 300 from Denmark.

Chevrolet Branch Increasing Force

OAKLAND, CAL., May 8—The Chevrolet Motor Co.'s factory here is increasing its working force to reach a production of 1000 cars a week, according to announcement by W. C. Williams, superintendent of the plant. Production for March was 2800 cars, with 600 men employed. For April, it will run above 3000 cars, and an effort is being made to pass the 4000 mark in May. About 850 men will be required to meet this increase in production, according to Williams. Increased demand is given as the cause for the increase in production.

Moves Into Larger Quarters

INDIANAPOLIS, May 8—The Electric Machine Corp. of this city has moved into larger quarters, increasing its floor space four times, and is expanding both its out-put of electric testing machines and of wireless equipment. For some time this concern has manufactured rotary spark gaps for wireless sending apparatus. Recently it has entered the radiophone receiving set manufacture, though not yet in production in this line.

Added Equipment for Hupp

DETROIT, May 10—Increased Hupp production has made it necessary, the factory declares, for the company to install an extension heat treating plant in its branch factory at Jackson, Mich. The additional equipment will be used for heat treating steering knuckles, steering arms and levers, and several small forgings, such as handbrake levers, clutch and release levers.

Receivers to Handle Stevens-Duryea, Inc.

Appointed on Petition of Fisk Tire—Assets Nearly Triple Liabilities

SPRINGFIELD, MASS., May 9—Harry G. Fisk of this city and Frank H. Shaw of Chicago were appointed receivers for Stevens Duryea, Inc., of Chicopee, Mass., in Superior court here to-day. This action was on petition of the Fisk Tire Co., Inc., by recommendation of the creditors committee. The petition was uncontested. Sureties of \$25,000 are required of each of the receivers, the bonds to be filed within 10 days.

The receivers are empowered to take over all the assets. Indebtedness is said to total \$1,100,000. Net assets are approximately \$4,000,000, of which \$350,000 are notes receivable, finished and partly finished cars. About \$2,000,000 is in real estate and equipment and most of the remainder is in the form of material and cars.

The petition set forth that on account of the business situation the company was cramped for funds and this hampered its efforts to manufacture and deliver cars to fill orders, of which it had a large number.

It was stated that unless the petition was granted the plant would be obliged to close with serious loss to all concerned. The petition stated that \$4,800,000 of preferred stock is outstanding, together with \$30,000 class A and \$70,000 class B common stock.

Relied on Banks for Help

President Ray S. Deering gave out a statement in which he said the company had relied on New York and Chicago banks for credit, and the closing of one bank last January had cut off one of its principal avenues. As a first expedient the company sought to get authority from the stockholders to provide additional capital and refund its obligations by placing a mortgage on its plant, which is clear of encumbrance. This it was unable to do readily, owing to wide distribution of the shares. It then asked creditors for an extension of six months. This plan was acceded to by most of them, but the action of certain ones in filing attachments created a situation that made a receivership seem advisable.

He added that the creditors had found the company to be solvent, and that it is contemplated the receivership will be temporary. Sales have been increasing, he said, and orders are sufficient to keep the plant operating for two months.

INTERNATIONALIZING BEARINGS

NEW YORK, May 8—The American Sectional Committee on Ball Bearings has decided to recommend the adoption of certain proposals tentatively agreed to by the German and Swedish ball bearing committees for international standardization of bearings. These proposals

will necessitate certain changes in the standards of the Society of Automotive Engineers, but only in sizes which are used to a very limited extent. It is believed, therefore, that an agreement will be reached soon as to international standards. The purpose of the plan is to have bearings manufactured in other countries which will be suitable for use in American made cars.

Soft Top "Utility Coupe" Brought Out by Chevrolet

DETROIT, May 9—The Chevrolet Motor Co. has just brought out a new closed car designated as a "utility coupe" which will sell for \$720, f.o.b. Flint, as compared with the \$875 price of the regular coupe model in the 490 line. It is of two-passenger type and is designed especially as a vehicle for all year use by business and professional men.

This is the first of the General Motors units to bring out a model in the new soft top glass, inclosed vehicles. The mechanical features of the car are identical with the Chevrolet 490 line. The lines of the top are square and give the car a low built effect. Doors are exceptionally wide, allowing a 28 in. opening and are provided with double latches and anti-rattling devices.

A feature of the new car is the unusually large rear compartment affording a space of about 15 cu. ft. to accommodate samples, advertising matter, instruments, etc. The size of the compartment is concealed by the body lines.

Business in the new type of closed car is reported by factories which had models at the New York show as running high. Hupp and Dort have been in production for several months, and Dodge is about to enter production on its model. Hudson-Essex, whose coach was the progenitor of the line, finds it a leader in the closed car field.

Electrical Parts Service Abroad Being Developed

NEW YORK, May 8—The development of electrical service and parts distribution to cover the Delco, Remy and Auto-Lite starting, lighting and ignition equipment in the important trade centers of the world has been taken over by the Overseas Motor Service Corp. of this city. Parts distributors are being appointed who will carry stocks and offer electrical service to car dealers and owners, each distributor being given a defined territory in which to operate. Each dealer in the territory then will call upon the distributor for whatever service may be required.

The Overseas Motor Service Corp. is one of the General Motors subsidiaries, specializing in the foreign sales of accessories and equipment. The arrangements with Delco, Remy and Auto-Lite were worked out by S. W. Dorman, general manager of the company, and several distributors already have been appointed in such centers as Havana, for the island of Cuba; Ancon, for the Republic of Panama and the Canal Zone.

500 Ford Cars Sent of Auto-Lite, May 29

Shipped from New York in Semi-Knockdown Condition—Market Greatly Improved

DETROIT, May 10—The Ford Motor Co. shipped approximately 500 cars from New York into Belgium in April in semi-knockdown condition. The market for Ford cars is said to be showing considerable improvement in that country, and there are now about 2300 in service. The price there, without starter or demountable rims, is \$692.18. Since the armistice 37 per cent of all cars imported into Belgium have been of American make, according to the Ford statement. Prices for American cars are declared lower than the Belgian-made product. General conditions there are reported as opening up an extensive field for American cars.

Foreign plants of the Ford Motor Co., exclusive of the Ford Motor Co. of Canada, produced approximately 14,000 cars in the first three months of 1922. This compares with 3779 in the first three months of 1921. The company declares this showing to indicate much better trade conditions in foreign countries. The Manchester, England, plant in the first quarter of 1922 made 7223 cars and trucks, as compared with 2377 in the same period last year. Buenos Aires production ran 3000 ahead of the same quarter last year. In March the output was the largest in the history of the plant. Copenhagen turned out 800 cars and trucks in March, comparing with 200 a year ago. Output in the plants at Bordeaux, Cadiz, Copenhagen and Sao Paulo ran about three times as large as for the 1921 quarter.

Making House-to-House Canvass

The Ford Motor Co. of Canada has initiated a simultaneous canvass of all Dominion residents, from coast to coast, by which the 685 dealers are said to be literally combing for live prospects. In two months there should not be a home in Canada which has not heard the Ford message. A report on the canvass says a similar canvass for closed car buyers in September resulted in an increase of 40 per cent in closed car sales over the previous winter.

COLUMBIA MAKES 40 CARS DAILY

DETROIT, May 9—Columbia Motors Co. is now working on a schedule of 20 light sixes and 20 of its heavier model daily and is aiming to increase its output by June 1. The company was delayed in getting into heavy production on the new light car in April owing to material tie-ups, but is now rapidly approaching capacity.

The company has been considering leasing the recently vacated Saxon plant which adjoins the main Columbia factory. This would give an increased capacity of 125 daily. Orders now on hand are declared to insure 100 per cent production for several months.

Reeves Gives Views on Trade Body Work

**Tells Manufacturers Association
Sherman Law Exemption Not
Desired**

NEW YORK, May 10—Service which is of direct benefit to the public supplies the best proof of the increasing need for properly conducted trade associations, according to Alfred Reeves, president of the Trade Organization Executives of New York, who addressed the convention of the National Association of Manufacturers at the Waldorf-Astoria today on "Relations of Trade Associations to the Public."

Reeves, who is also general manager of the National Automobile Chamber of Commerce, asked that so-called "open price bureaus" be not put in the class of trade associations, with their score of activities that have no relation to prices or production.

Activities of Public Value

Trade association activities of value to the public, he said, include research work which makes for more scientific use of products, activities relating to more prompt delivery of goods, better service, more uniform standards of design and material as a basis for comparison, protection against untrue or exaggerated forms of advertising, the elimination of unnecessary styles, the reformation of unfair trade practices that tend to deceive and the thing which is of very definite value to the consumer—lower prices for the things he buys.

Reeves declared trade associations do not want exemptions from the terms of the Sherman law, but want the fundamentals of that law maintained. He questioned the need of any more legislation and asked for a vigorous enforcement of present laws in the belief that present governmental departments had ample powers to investigate those trade association activities which Herbert Hoover says are in the "twilight zone."

"Price Competition" Class Small

Reeves said further:

Some trade associations and open price bureaus which have to do with the so-called "open price competition" are under fire, but they are only a small percentage of the 500 or more trade associations that have become such an important factor in the upbuilding of American trade in this country and also to meet the competition in our struggle for the world's markets.

Trade associations are a natural result of the concentration of effort toward lower prices for better goods, to the ultimate broader purchasing power by the public.

The trade association is a voluntary organization to which all of standing in the same line of business are admitted to membership. It is not autocratic. It undoubtedly supplies the greatest benefits to the small manufacturer or dealer. In a vast number of cases it does not include some of the biggest manufacturers, which disposes of the suggestion that trade associations make for monopoly. Most of them aim to cut out

duplication of work, to simplify manufacture and to make products better and to reduce the required capital on the part of manufacturers and merchants.

Price is something which most trade associations studiously avoid, but as associations in such activities are well known, an investigation by the proper governmental department should prove quickly whether or not they are operating in violation of law.

Lincoln Receivers Deny Claims of \$4,250,000

DETROIT, May 10—Claims aggregating \$4,250,000 against the Lincoln Motor Car Co., preferred by seven individuals, were denied to-day by the Detroit Trust Co., receivers. The claimants were indorsers of notes issued by the motor car company, and the trust company to-day demanded they pay these notes.

The notes are held by the Peoples State Bank, the First National Bank, the Wayne County and Home Savings Bank, William H. Murphy and Joseph Boyer, all of Detroit, the Union Trust Co. of Pittsburgh, and the Continental & Commercial Bank of Chicago. The indorsers are Henry M. Leland, Wilfred C. Leland, William T. Nash, Joseph Boyer, William H. Murphy, John H. Emmet and John Trix.

Denial of the claims means, according to Elmer W. Voorheis, clerk of the Federal court here, that the \$4,250,000 if collected can be added to the \$5,000,000 now held in trust by the court for the company's creditors. The claims are said to total approximately \$5,000,000, independent of that of the Government for about \$9,000,000, which, it contends, represents overpayments on wartime contracts.

The Government claim, it is understood, has precedence over all others.

PLANS 81,000 SETS OF WHEELS

DETROIT, May 10—The Kelsey Wheel Co. has a schedule of 81,000 sets, four wheels and five rims, for May, which will make the month the largest from the point of production in the history of the company. Of these, about 30,000 sets are Fords and the remainder is divided among Studebaker, Hupp, Cadillac, Dodge Brothers and others. Ford business comprises about 37 per cent of the total.

LINCOLN AT HIGHEST POINT

DETROIT, May 10—Production and sales of Lincoln cars continue at the highest rate in the history of the company, with enough orders on hand to keep the plant at capacity for three months. Body makers are unable to keep up with orders which are coming in three times as fast as the output capacity.

TWO SHIFTS AT LIBERTY

DETROIT, May 10—Liberty Motor Car Co. predicts that May will exceed April in point of sales and production. April surpassed March which had established a new production record. Night and day shifts are employed.

Colorado Railroads Win in Truck Fight

**Utilities Body Says Vehicles as
Taxed Now Are Not Entitled
to Use of Highways**

DENVER, May 10—The railroads of Colorado have won an important victory in their campaign against the operators of motor trucks who have taken away from the carriers a large share of the short haul freight traffic. This anti-motor truck campaign has resulted in a decision by the Public Utilities Commission of Colorado that the truck operator is not entitled to the use of state highways until the taxing laws are so amended that he "shall contribute his due proportion to the cost of construction and maintenance of the highways."

The commission asserts that an investigation it made of the transportation conditions in Eagle and Garfield counties showed that, although there were 68 motor trucks operating as public carriers, they paid into the state treasury only \$819 a year, while the Denver & Rio Grande Western Railroad, which these buses parallel, paid during the same period, \$38,023 for the public roads which they do not use at all, and additional taxes bringing the total paid by the railroad company up to \$153,896.

The section of the decision defining "public convenience and necessity" follows:

Public convenience and necessity, by which must be understood the convenience and necessity of the people at large as contradistinguished from the convenience and necessity of a very small number of persons who seek to derive a profit from the farmers' and home owners' investment in roads, never contemplated that the truck driver should destroy that, to the cost of construction of which he contributed little or nothing, or that he should reap where he has not sown.

Wheel Companies Add to Plant and Products

DETROIT, May 11—The Motor Wheel Corp., Lansing, is building additions to its disk wheel and wood wheel factories to meet the steadily increasing demand in the wheel department of the automotive business. Contracts require that the new buildings be rushed to construction.

The demand for disk wheels, both from car manufacturers and from replacement sources, are reaching new heights. Orders placed by car makers in several instances will keep factories at forced capacity for several months, and in one instance the equipment business has been so heavy as to cause the manufacturer to cease indefinitely all shipments for replacement purposes.

Hayes Wheel Co. will get into production this month with a complete line of disk wheels, thereby giving the company representation in all types of wheels. The disk type will be demountable at the rim and will use Hayes standard felloes, hubs and other wheel fittings.

U. S. Registration Bill Has Opposition

Car Makers and Owners Testifying at Washington Urge Measure Be Killed

WASHINGTON, May 11—Nation-wide opposition to the Mills compulsory registration bill was voiced to-day by representatives of manufacturers and automobile owners associations who appeared before the House Ways and Means Committee urging that the bill be killed.

The opposition to the measure, which provides for a \$2 registration fee through which it is expected to destroy the market for stolen cars, is based on the ground that the automotive industry now is bearing all the taxes that the traffic will bear, and that if a fee of \$2 is charged now it will be the entering wedge for further taxation by the Federal government.

Say Sales Would Be Curtailed

From a manufacturer's viewpoint, the view was expressed that the resale of automobiles would be greatly curtailed through the almost endless confusion of giving titles. Under the provisions of the bill a buyer must protect himself by having his title, before purchase, looked up in the same manner as is now done in the transfer of real estate.

The cost, it is admitted, would be materially offset by the saving in insurance. It is figured that the cost to motorists would aggregate \$30,000,000 a year, including the \$2 tax, notary fees and filing cost, in addition to the time lost in recording the papers.

In an effort to submit to the committee considering the measure, a telegram was sent to the state directors of the American Automobile Association, asking for their opinion on the Mills bill. But three states indorsed the measure, the others voicing strong disapproval of it.

A. A. A. Files Protest

As a result of the protest made by the 340 active clubs of the A. A. A., representing 500,000 members, the following report was filed with the committee opposing the measure:

Motor cars are to-day taxed directly from six to eight different times, and now comes the proposition of a Federal tax, which will necessitate miscellaneous charges for registering and re-registering, which in all would substantially make it a tax of over \$30,000,000 a year.

It is impractical from the standpoint of affixing a "permanent" number to the parts of an automobile.

Should such a number be affixed once, the constant necessities of the motor car industry are such that in the repair of cars, it would place on the industry an unwarranted burden.

The Federal Government should not set up the principle of making abstracts of title for automobiles any more than they should for realty.

The benefits to be derived are not in keeping with the expense of the undertaking.

An opinion was expressed to the com-

mittee by Dr. H. M. Rowe, former president of the A. A. A., that the measure, if passed, would be illegal. "I seriously doubt the constitutionality of such a bill as the Mills' measure," he said, "as it certainly is a usurpation of the authority of the states and is not an inherent right of the Federal government."

A letter from M. L. Heminway, general manager of the Motor and Accessories Manufacturers Association, opposing the measure, was read to the committee. In substance Heminway expressed the view that the bill, if passed, would offer an excuse for further Federal taxation, which, he said, "is now excessive."

FINANCIAL NOTES

Republic Rubber Corp. up to April 12 sold \$800,000 of the \$1,000,000 authorized certificates of indebtedness. The net loss for the first quarter was \$39,102. In a statement to stockholders of the corporation on March earnings and gross business for the quarter, Receiver C. H. Booth says, "Gradual reduction of losses and the profit finally shown in March seem to indicate that this industry is fundamental and that the company when ultimately reorganized on a reduced capitalization and placed on a proper financial basis should regain its former position as one of the substantial industries of the district."

Ajax Rubber Co., Inc., reports that since Jan. 1 it has been operated at a profit which in the first quarter was more than twice the amount required to satisfy bond interest in that period. This is in contrast to the heavy losses sustained in 1921, due to inventory adjustment and abnormal market conditions. It is stated that the business on order and in prospect should create net earnings applicable to the bonds of at least \$1,700,000, or more than seven times the annual interest charge, and more than four times the year's interest and sinking fund requirements.

Yellow Cab Manufacturing Co.'s directors have voted to double the company's outstanding B stock, an increase of 100,000 shares. The new stock will be offered to the stockholders at \$30 a share. Recently the company declared a 100 per cent stock dividend. At present quotations the stock outstanding has an equivalent value of about \$500 for the old stock. The company's net earnings for the first four months of 1922 are reported to be more than \$800,000.

Goodyear Tire & Rubber Co. of Canada shows a net profit of \$251,294 for the six months ended March 31. This was reached after reserve of \$204,328 had been set aside for depreciation of plant and before valuation of inventories on the basis of the latest market prices. Current assets amount to \$6,340,597 against current liabilities of \$736,919. Cash on hand and in banks on March 31 amounted to \$579,737.

Dort Motor Car Co. reports that since Oct. 31, 1921, its liabilities have been reduced by \$600,000, and its cash in bank increased \$100,000. At the present time the company has unfilled orders which will keep its plant running at capacity for several months. The company's production, which for March averaged 40 cars a day, has risen to over 100 cars daily.

Hayes Wheel Co. stockholders will vote on a proposal to increase capital to full authorization to 200,000 shares by declaration of a 22 per cent stock dividend. It is also proposed to change the present \$10 par value shares to no-par value shares.

BANK CREDITS

Written exclusively for AUTOMOTIVE INDUSTRIES by the Guaranty Trust Co., second largest bank in America.

Last week call money ranged between 3½ per cent and 5 per cent as in the previous week. There was no essential change in the time money situation. Funds were in fair supply and were still available at 4¼ per cent for all maturities from 60 days to 6 months. Trading was reported dull, with no important loans recorded. The prime commercial rate was 4¼ per cent, as compared with 4½ per cent in the previous week.

The Federal Reserve statement as of May 3 showed a decrease of \$6,022,000 in total reserves and a decrease of \$426,000 in gold reserves. Total bills on hand increased \$34,039,000 and total earning assets \$76,023,000. Total deposits showed an increase of \$59,102,000, and Federal Reserve notes in circulation increased \$15,868,000. The reserve ratio decreased from 78.3 per cent to 76.7 per cent.

On May 5 demand sterling was quoted at \$4.44½, the highest point it has reached since July 14, 1919, when sterling was "unpegged" by the British Government.

According to reports filed with the Interstate Commerce Commission, the net operating income for March of the Class I railroads was more than \$83,000,000, as compared with over \$47,000,000 in February and more than \$30,000,000 in March, 1921. The net operating income for March, 1922, represents earnings at the annual rate of 5.83 per cent on the tentative valuation as fixed by the Interstate Commerce Commission. This compares with 4.57 per cent for February and 2.15 per cent for March of last year.

The total number of commercial failures reported for April was 1948, a decrease of more than 15 per cent from March and four times larger than the total for April, 1919, a record low year. The liabilities involved for April, 1922, amounted to \$72,553,740, an increase of 20 per cent over March and of 42 per cent over April, 1921, but a decrease of 31 per cent from the total for January. The Southern section reported 29 per cent of the total failures for April.

NEW STUDEBAKER BODY MODEL

SOUTH BEND, IND., May 10—The Studebaker Corp. has added a new body model to its line. This is a four-passenger type and is to be known as the Big-Six Speedster. The rear seat is provided with an unholstered dividing arm and considerable extra equipment is included in the price, which is \$1,985.

Among the items of equipment are disk wheels, including two extra wheels with tires, front and rear bumpers, traveling trunk and trunk rack and courtesy light. To provide room for the trunk rack at the rear, the spare wheels are mounted one on each running board just forward of the front doors. The body is painted a dark blue with gold striping on the hood louvers.

INDUSTRIAL NOTES

U. & J. Sales Co., manufacturer of the U. & J. carburetor, whose factory in Chicago was destroyed by fire recently, has purchased a three-story factory building at Twenty-ninth and Halstead streets that city, and expects to be in full production by June 1. The new factory has 45,000 square feet of floor space and the company expects to add another story. The company intends to manufacture several new devices pertaining to ignition, lubrication and transmission, according to C. A. Kemper, sales manager. Orders received in the last 15 days exceed those of the previous 30 days, Kemper said, and he expects this year's business of the company to equal or exceed that of the previous best year.

Martin-Wasp Corp., Bennington, Vt., has developed a body stock sawing department within the last year. Contracts are now being carried out for production body builders for sawn stock to be used in the construction of closed jobs for Packard, Cadillac and Lincoln. The firm has developed the Martin system of pattern sawn body stock and its plant is equipped for the production of all wood pieces entering body construction, sawn and ready for final machining and assembly. Karl H. Martin is president of the company.

International Steel Products Co., Hartford, Wis., has been reorganized into a new corporation under the name of the International Stamping Co. Refinancing has been provided by some of the members of the old corporation, which will give the company ample funds to take care of its business. The company will continue to manufacture mufflers and automobile specialties as well as some electrical wireless devices. A. F. Schauer is president of the corporation.

Ludington Tire Co. is shipping its plant equipment from Ludington, Mich., to a new location at Pontiac. Necessity to get larger space has caused the change in location. For the present the equipment will be set up in a local shop while efforts are made to get a permanent location. Negotiations are pending for a factory building and five acres of land formerly used by a die-castings company. The concern makes an armored puncture-proof tire.

Pennsylvania Rubber Co. of America, Inc., has moved its New York branch from 1889 Broadway to 2006-2008 Broadway. The new location triples the space previously occupied. The export division of the company, which was formerly located in the Woolworth Building, will be housed in the new quarters. The branch is in charge of G. C. McCullough. Export business is in charge of D. Dudley F. Yard.

Rockford Motor Co. has been appointed general distributor for Mitchell cars in the Chicago territory. The arrangement involves the establishment of community sales and service stations in all parts of the city which will provide Mitchell patrons with sales and service accommodations in their neighborhood.

Center Fed Spring Insert Sales Co., Wilkes-Barre, has opened an additional office in Cleveland, at 1268 Hanna Building, in charge of N. H. Eckman. L. E. Hulet, consulting engineer of the company, will also make his headquarters at the new Cleveland address.

CADILLAC SEES BIGGEST YEAR

DETROIT, May 10—H. H. Rice, president of the Cadillac Motor Car Co., com-

menting upon current business of Cadillac, says in part as follows:

Cadillac sales for the current year up to the first of May were two and one-half times the corresponding period of last year. The sales in March and April were two of the largest months Cadillac has ever experienced. Only three other months ever equalled and only one other month was larger than the sales in March. The sales by months since the new type 61 was announced have steadily increased.

The new plant in Detroit which made available much larger capacity than Cadillac heretofore enjoyed, is approaching capacity. The company feels that the Model 61 is the most successful in its history, both from the standpoint of style and design as well as mechanical excellence.

The forecast of sales for the current year indicates that this year will exceed any year in the company's history.

Need of Good Roads
Felt in Argentina

BUENOS AIRES, ARGENTINA, April 11 (By Mail)—The necessity for immediate action in starting a national campaign for improved highways throughout Argentina is being recognized through the calling of the National Congress on Good Roads, which will convene here during the last fortnight of May. This national necessity is being backed not only by national, provincial and municipal authorities, but also by the public at large.

The object of the Congress is to reach the most practical solution of the problem of national highways. All sessions will be public and the delegates in attendance will represent the national, provincial and municipal governments, trade organizations, engineering societies, and corporations and firms interested in road transportation and promotion.

Like all conventions, this one will have its popular features to attract public attention. The principal one in this case will consist of a parade in which every mode of road transportation used in each period of Argentine history will be shown.

SERVICE ORDERS ENGINES

WABASH, IND., May 9—The Railroad Division of the Service Motor Truck Co. has released a large quantity of Midwest 4½ x 6 in. engines, made by the Midwest Engine Co., Indianapolis, for its gasoline propelled railway coach. This engine is a comparative newcomer in the Midwest line, having been developed for the heavier-duty class requiring high speeds. It develops 59 hp. at 1200 r.p.m. and 70 hp. at 1500 r.p.m. The torque peak is increased 50 per cent over that of the 4½ x 6 in. Midwest engine.

DEMAND FOR TRANSMISSIONS

KALAMAZOO, MICH., May 10—Fuller & Sons Manufacturing Co., manufacturers of truck transmissions, has orders in excess of \$1,000,000 booked, and in an effort to keep up with the production schedule has issued a call for former employees to return to work.

METAL MARKETS

AMONG representative steel producing interests the impression prevails that a policy of skimming the fat off the market as it appears to-day is fraught with considerable danger for its future. This attitude marks a return to the before-the-war attitude of the industry when true sales generalship did not consist so much of thinking of the problems of to-day as of those of the morrow. It was only natural that the hand-to-mouth buying of consumers, which up to six weeks ago was considered as the embodiment of good management, should find its reflex in lessening the sharp look-out which producers had formerly maintained so as to detect squalls in the offing and to avoid them.

Old time longsightedness, however, appears now to have returned. Conditions in the last few weeks were such that it would have been a very easy matter to bring about a runaway market, shortlived as it probably would have turned out to be. The restraint shown by representative steel sellers and the tight hand which they kept on the market denotes gratifying recognition of the menace that lurks in inflation. Even those whose sales policy it is to take advantage of every up in the demand, trusting to luck that they can avoid the dips, are now beginning to wonder what will happen to steel prices with the collapse of the coal strike.

The large factors are assuming a waiting attitude, confident that their outstanding commitments are safe at booked prices, and as for third quarter business they are willing to sit back and let prices shape themselves in a natural way. If the coal strike fizzles out in the next few weeks, it will not have added any appreciable expense to steel making costs, but certain it is that consumers will expect an easing off in values.

Pig Iron.—With reports of foundry iron being held at as high as \$24@25, valley base, the present movement seems to have spent its strength. Pig iron interests fully recognize that prevailing prices are largely temporary, and with additional blast furnaces resuming almost every week there is likely to be steadily growing competition for second half deliveries.

Steel.—Those of the independent sheet producers who announced advances of \$5 to \$7 per ton over April 1 quotations are reported to have booked relatively little business at these higher prices. What orders they booked were virtually all for rush delivery and the advance is really in the nature of a premium on early delivery. The chief interest is out of the market, except for heavier blue annealed, having enough orders in hand to operate normally and being unwilling to commit itself further pending the clarifying of the situation. Steel supply conditions are such that strip steel producers are not anxious for additional business, although inquiries from the automotive industry continue heavy. Prices are firm. Further advances in bolts and nuts are predicted.

Aluminum.—Automotive foundries have been buying No. 12 alloy freely, but the sheet market has turned somewhat quiet. Rumors have been current that the leading producer of low-priced motor passenger cars was planning the use of aluminum sheets in closed cars. This rumor makes its appearance at regular intervals, and naturally never meets with authoritative denial.

Copper.—Domestic consuming demand is fair with production on the steady increase. The market is steady.

Calendar

SHOWS

Nov. 13-18—Chicago, Annual Show and Meeting of the Automotive Equipment Association.

FOREIGN SHOWS

March 10-July 31—Tokio, Japan, Peace Exhibition.

May—Shanghai, Exhibition of Road Building Material.

May, 1922—Quito, Ecuador, Agricultural Exposition, celebrating Centenary of Ecuador, Automotive Section.

May 1-15—The Hague, Automobile Show, also Airplanes and Motorboats. Secretary, Spui 185, The Hague.

May 6-21—Scheveningen, Automobile Show.

May 24-June 5—Barcelona, Spain, Automobile Show under Dealers' Direction.

May 28-June 5—Prague, Motor Show, Hotel de Ville.

July 1-24—London (Olympia), Aircraft Exhibition.

Sept. 1922—Rio de Janeiro, Brazil, Automobile Exhibits in Connection with the

Brazilian Centenary Association Automobilsta Brasileira.

Sept. 15-20—The Hague, Automobile Show.

Sept. 25-Oct. 3—Berlin, Automobile Show at the Kaiserdamm Hall under the auspices of the German Automobile Manufacturers Association.

September—Buenos Aires, Argentina, Annual Exhibition, Sociedad Rural Argentina.

Oct. 4-15—Paris, Automobile Show, Grand Palais.

Oct. 12-23—London (Olympia), International Commercial Vehicle Exhibition.

Nov. 3-11—London (Olympia), Automobile Show.

Nov. 10-Dec. 19—Brussels, Automobile Show, Palais de la Cinquantenaire.

Nov. 29-Dec. 4—London (Olympia), Cycle and Motorcycle Show, British Cycle Motors, The Tower, Warwick Road, Coventry.

November—Buenos Aires, Argentina, Annual Exhibi-

tion, Automovil Club Argentino.

RACES

May 30—Indianapolis, International Sweepstakes.

July 15—Strasbourg, French Grand Prix.

CONVENTIONS

May 16-17—Detroit, Semi-Annual Convention, Factory Service Managers, National Automobile Chamber of Commerce, Hotel Statler.

May 16-18—Washington, D. C., Annual Meeting of the Chamber of Commerce of the United States.

May 19-20—St. Louis, Annual Meeting of the American Automobile Association.

May 22-25—New York, Palisades Interstate Park, Second National Conference on State Parks, Bear Mountain Inn.

June 11-15—Milwaukee Annual International Convention of the Associated Advertising Clubs of the World.

June 19-20—Detroit, Summer Convention of the Automobile Body Builders Association.

June 19-24—Colorado Springs, Summer Meeting, Automotive Equipment Association.

June 26-July 1—Atlantic City, Twenty-fifth Annual Meeting of the American Society for Testing Materials, Chalfonte-Haddon Hall Hotel.

August 28-Sept. 2—Detroit National Safety Congress.

Sept. 18-23, 1922—Rome, Italy, Second Annual Meeting of the International Chamber of Commerce.

S. A. E. MEETINGS

June 20-24—White Sulphur Springs, W. Va., 1922 Summer Meeting of Society of Automotive Engineers. Detroit, May 19. The Pennsylvania section will hold an outing at Torressdale or a body meeting on May 25.

New Reimportation Bill Undermines Old

WASHINGTON, May 9—Senator Frelinghuysen of New Jersey, Republican, has introduced a bill in the Senate which provides for the return from Europe of motor-propelled vehicles and other equipment used by the American forces in Germany for distribution to the state highway departments. In effect, this bill, if passed, would circumvent the purposes of the so-called Graham resolution which was drafted for the express purpose of protecting automotive manufacturers and dealers from unfair competition, due to the reimportation of war supplies.

Bill Referred to Committee

The Frelinghuysen bill is known as S. 3562 and has been referred to the Committee on Military Affairs. It provides that the Secretary of War should transfer to the Secretary of Agriculture "all motor-propelled vehicles and other machinery, equipment and supplies, suitable for road-building purposes, and now in the possession of the American forces in Germany for return to the United States for distribution to the state highway departments for use in the construction, reconstruction and maintenance of public highways under existing legislation. The Secretary of Agriculture is also authorized to transfer to the Secretary of Interior, upon his request, any of the equipment so returned to the United States for use in the improvement of public highways within and adjacent to the national parks and Indian reservations."

Section two of the measure provides that the Secretary of Agriculture may preserve not to exceed 10 per cent of the equipment for use and construction, reconstruction and maintenance of national forest roads or other highway building under his direct supervision. Otherwise

the distribution will be upon the same basis as that provided for in the Federal Highway act for the distribution of Federal aid funds.

This measure would affect 411 motor vehicles now in the possession of the American Army in Germany. Of this number 300 are trucks.

Smith-Springfield Body Has New Set of Officers

SPRINGFIELD, MASS., May 10—Several new directors for the Smith-Springfield Body Corp. were elected at the annual meeting here. The new men on the board are F. A. Woods of Holyoke, Lewis Tift of Springfield, Hugh Govern and A. H. Wolfe of New York, C. S. Dame and F. M. Livingstone of Springfield.

The directors elected an entirely new staff of officers. Dame was chosen president in place of Hinsdale Smith. He also will serve as treasurer of the company. A. H. Wolfe was made vice-president; Livingstone, assistant treasurer, and Raymond A. Bidwell, secretary. A. P. Smith formerly was secretary and treasurer.

Stockholders were informed that the plant is running at about 60 per cent of capacity, and that orders in prospect and inquiries indicate that it will be running at capacity by early summer. About 200 men now are employed. The company is making bodies for such companies as Rolls-Royce, Minerva, Renault, Lincoln, Winton, Packard and Marmon.

50 HARVESTER TRUCKS DAILY

SPRINGFIELD, OHIO, May 9—Although handicapped by lack of material, the Springfield works of the International Harvester Co. is keeping up with its schedule of 50 motor trucks a day. This schedule will be maintained until July. Orders are coming in steadily.

Japanese Army Test Following Old Lines

TOKIO, April 13 (By Mail)—Local automobile dealers received notice to-day that the annual motor test held by the Imperial Japanese Army will take place this year on May 10 and 11.

It is probable that the test will follow closely the lines laid out in the 1921 test, which was considered to be very successful, but dealers are not informed beforehand as to its exact nature.

Last year 16 different makes of trucks and 22 makes of passenger cars competed. The first day's test was held at Yoyogi Parade Ground, on the outskirts of Tokio, and covered design, acceleration, brake action and spring action in the passenger car class. The trucks were required to proceed a quarter-mile in low speed at full throttle, and then the same distance at full throttle in reverse, after which temperature tests were taken.

Observers With Vehicles

The second day's test consisted of a trial run, 97 miles for passenger cars and 65 miles for trucks, the two routes being different, but both covering a variety of difficulties in the way of hills, bad roads, etc. From two to five military observers rode on each vehicle, and both trucks and passenger cars carried their full rated capacity. In this test particular attention was paid to gasoline consumption, hill-climbing ability and cooling. General performance was closely observed. Owing to the very narrow roads, several accidents occurred, and four trucks were unable to finish.

The test is of great interest to dealers, as the results are published and are available to the public. No winner is announced, but the Automobile Department of the Army usually places an order for one or more of the vehicles which have done the best in their class.